“PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY”

Dissertation submitted in partial fulfilment of the requirements for the degree of

M.D. (DERMATOLOGY, VENEREOLOGY & LEPROSY)

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CERTIFICATE

Certified that this dissertation titled **PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY ”**is a bonafide work done by **Dr.A.S.NIRAAIMATHI,** Post graduate student of the Department of Dermatology, Venereology and Leprosy, Madras Medical College, Chennai – 3, during the academic year 2015 – 2018. This work has not previously formed the basis for the award of any degree.

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I, **Dr.A.S.NIRAAIMATHI** solemnly declare that this dissertation titled **"PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY"** is a bonafide work done by me at Madras Medical College during 2014-2017 under the guidance and supervision of **Prof. S.KALAIVANI, M.D., D.V.,** Professor and Director, Institute of Venereology, Madras Medical College, Chennai-600 003.

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CONTENTS

Introduction

INTRODUCTION

Sexually transmitted infections, which includes HIV infection continue to be major health problem in many parts of the world, although effective preventive interventions are available. The distribution of STI in a community is not uniform, as behavioral aspects tend to differ between individuals as well as between sub groups of a population. Multiple sexual partnerships are an important risk behavior for STIs.

Female sex workers are regarded as a core group for transmission of HIV due to their high infection rate and more number of sexual partners. The clients of sex workers represent a bridge population, which is linked to low risk groups like spouses, girlfriends and casual partners[3].

Due to differences in the socio economic status, knowledge, attitude, practices of protective measures, the prevalence of STIs vary considerably in sex workers. Sex workers are affected early in the HIV epidemics in their country, due to their high risk behavior. Intervention with sex workers is one of the most cost effective HIV control strategies.

There is increased need for detection of STIs, particularly where there is high concentration of high risk individuals, as early diagnosis and treatment can lead to reduction of complications.[4]

The aim of this study is to detect the prevalence of STIs among female sex workers attending Institute of venereology, chennai

Review of literature

REVIEW OF LITERATURE

Sexuality is a basic aspect of life, which carries potential to form a new life and also fulfills personal and social needs[1]. Unhealthy sexual behaviors and attitudes result in many adverse outcomes including HIV infection. In sexual health, fundamental determinants at population level are exposure pattern, social, cultural, economic, physical and environmental factors[2].

DETERMINANTS OF SEXUAL HEALTH

Understanding the determinants of sexual health will help to shape the intervention responses. Sexual health approach includes characteristics of infectious agent, individual characters, sexual behavior pattern, social and cultural environment. Intervention should be done at all levels of society from individuals to communities to optimize benefits of sexual health[3].

INFECTIOUS AGENTS

A wide range of microorganisms depend, in whole or in part, upon human genital tract and sexual behavior for their survival. More than 30 pathogenic agents, including HIV are sexually transmissible and are responsible for great degree of mortality and morbidity.

The patterns of sexual health and disease transmission are influenced by the evolution of infectious agents. Most important concern is the emergence of antimicrobial resistance in these agents. It makes the organism more virulent and difficult to treat[4].

INDIVIDUAL FACTORS

Patterns of individual sexual behavior determine the risk of acquiring a STI. Factors like number of partners, rate of partner change, frequency of sexual practices influence the STI transmission risk[5].

Individual factors like education, occupation, income, sexual orientation influence ones risk of acquiring STI. These individual level factors are targeted by approaches to STI prevention.

SOCIAL CONTEXTS

It refers to demographic, socioeconomic and other related aspects of individual environment. Poverty, substance abuse, sex roles, prevalence of STIs are community factors which can escalate the risk associated with individual behavior and can hamper the individual to adopt preventive measures[6].

COMMERCIAL SEX WORKER

Commercial sex worker or prostitute is a person who provides sexual service for money or other gains. They are found in brothels, bars, parlors and night clubs. They have high rates of partner change, poor access to health care, increased duration of exposure to infection, so sexual contact with CSW is an important risk factor for acquiring STI.

Sexual intercourse in exchange for remuneration is known as prostitution. Prostitution is punishable by death in some countries, while completely legal in others. Due to social stigma associated with prostitution, prostitutes may be referred as commercial sex worker', 'female sex worker' or 'sex trade worker'. Male organizers of prostitution are known as pimps. Female organizers are known as madams.

Establishments which are specifically dedicated to prostitution are the brothels. These are often located in 'red light areas' in big cities. Some examples of these places are G.B. road in New Delhi, Budhwar peth in Pune, Sonagachi in Kolkata, kamathipura in Mumbai.

Travelling to poorer countries in search of sexual services that is not available or costly in one's own country is sex tourism. Prostitutes are often stigmatized in all societies and religion, but their customers are stigmatized to a lesser extent. Prostitutes have more STIs and abortions, so they can easily become sterile, but many of them still become pregnant and give birth to children[7].

HISTORY

India has a long history of prostitution as a profession. In Kautilya's Arthashastra and Vatsayana's Kamasutra, a whole chapter was devoted to prostitution[8]. In vedic texts prostitutes were referred as 'loose women', 'female vagabonds' and 'sadbarani'.

Prostitutes wore red dresses and jewels in vedic times to frighten demons as they live in a immoral zone[8].

The devadasi system was a tradition in India by 300 AD. In this system, unmarried young girls are devoted to Hindu temples, which use them as objects of sexual pleasure. In the eighteenth and first half of nineteenth century, the period in which there was British rule in India, there were good reports of prostitution in large cities. In this period prostitution was not regarded as a shameful profession

In 1806, there were 2540 women in 593 brothels in Kolkata[10]. Accurate number of sex workers in India would be difficult to estimate because of the secret nature of sex industry and their wide distribution. Gilada's[11] estimates 1,00,000 in Mumbai and Kolkata, 40.000 in Delhi and Pune and 13000 in Nepal.

At present data on sexual practices and lifestyle of sex workers is less. The emergence of AIDS had given rise to few observational studies along with intervention program in prostitution areas of large cities. The observations of these studies are prostitutes lead a low standard of life in a deteriorated and unclean environments[12]. Pimps, madams and investors share major part of their payment. They do not get nutritious food and are often abused by local sellers

Majority of them are affected by different STIs intermittently. They have to rely on local quacks who will charge them enormously for treatment, as they may not make use of government health facilities due to fear of prejudice.

In a study conducted in Kolkata 1987, 59% of prostitutes were deserted by their husbands. Many of them come from poor families and they may have to send a considerable amount of money to their families[10].

DEVADASI SYSTEM

In Karnataka and Andhra Pradesh devadasi system still exists in some small Hindu temples as indicated by some studies[9]. However it is functioning silently because of laws against this system. Every year 100,00 young unmarried girls from poor families are devoted as devadasis to Yallama goddess in a temple of northern Karnataka[13]. They hypothesize that most prostitutes in the borders of Karnataka and Maharashtra are devadasis. Devadasi system is the commonest form of conventional sex work in Karnataka. Details of devadasi system has been found in records written in 12th century.

It involves religious ceremony in which young girls are devoted to gods and goddesses through marriage. They becomes wives of the gods and do various temple works. Over a period of time, providing sexual services to temple priests were also included in their duties. Devadasi system is also known as' sacred prostitution' because of the sacred setting and as devadasi women symbolize a form of divinity

A recently published study[14] provides the magnitude of devadasi system in Karnataka sex industry. Devadasi system is common in northern Karnataka and is socially and culturally rooted in many communities. Hence it is an example of interaction between environmental and individual factors.

Out of 1588 female sex workers studied, 414(26%) declared devadasi system as the reason for entering sex work. These women differ from non devadasi female sex workers in many aspects. Devadasi women work in rural environment, mostly home based and they are more likely to own a house. They have more partners per week, charge less than non devadasi female sex workers. Devadasi women are younger and illiterate comparatively.

Devadasi FSW are more likely to have never married as they have been already married to god. In Karnataka more than 25% of all FSWs are a part of devadasi system[14].

BIOSOCIAL FACTORS INFLUENCING WOMEN TO BECOME PROSTITUTES IN INDIA

When family and marital life fail or shatter due to various reasons, the woman would not be having any hold on life. Various causes of prostitution are lack of sex education, prior sexual abuse, media, bad peer group, unawareness, acceptance of prostitution, abuse by husband and widowed young woman.

Poverty, deprivation, and unemployment contributes to personal risk factors. Lack of employment in their native may force a women to travel faraway to work. Being at a greater distance from home can be associated with increase in risk behaviors.

Women may be disadvantaged in protecting their sexual health, where they are behold to a man for goods favors, money in return for sex[7].

EARLY AGE AT ENTRY

Early age of entry into sex work was found in 85% of sex workers in Delhi and Kolkata.

Their numbers are now rising. They are located in low to middle income areas and business districts. They are regularly recruited by brothel managers. 33% is the estimated percentage of young girls among prostitutes.

These girl prostitutes can be divided into common prostitutes, singers, dancers, call girls, devadasis and caged brothel prostitutes. Mumbai has caged prostitutes.

Maharashtra, Andhra Pradesh, Tamil Nadu, west Bengal and Karnataka have high supply of girl prostitutes. 85% of them are Hindus, 66% belong to backward classes[7].

CALL GIRLS AND HIGH CLASS ESCORT GIRLS

Call girls are prostitutes who are more educated and appealing than those living in brothels. They earn more and have freedom in choosing their clients. In a study it was found earning of call girls were from 50-100 per hour and 400 -10000 per night.

Quantitative Studies conducted in India Include:

- In a study conducted in Tamil Nadu among 248 commercial sex workers, 46.8% were 35 years or more, 59% were literates and 56% were married. Most of the FSWs (92%) were from outside study area. The age at first sexual intercourse was less than 18 years in 48 % of them[15].

- The mean age of entry into the sex work was 27 years.

- 50% of their clients were truck/lorry/bus/car/auto drivers and mean number of casual clients and regular clients in the previous week was 6 and 5, respectively. In the period of one month, 30% clients asked for anal sex and 25% of them had accepted that. Consistent condom usage was found in 16%. 27% were alcoholics and among them, 91% had habit of drinking before sexual act[15].

- In a study from Andhra Pradesh, 2005-06 , 3200 female sex workers were studied, 70% were illiterate, 50% were married and 41% of them had sex work as the only source of income[16].

- In Mysore city, 429 FSW participated in the survey at baseline and 425 at follow-up. The median age was 30 years, median duration in sex work was 4 years, and the majority were street based (88%)

Striking increases in condom use were seen between baseline and follow-up surveys. Condom use at last sex with occasional clients was 65% versus 90%, with repeat clients[17] .

- 22% self reported engaging in anal sex , though demand from clients was higher (40%). The reasons for anal sex included more money (61%), influence of the client (45%), fear of losing client (27%), and forced sex (1.2%). Factors influencing anal sex were more number of clients, increased duration of sex work, more money, and older age group. Associated risks perceived by FSW were bleeding and injury to anal canal (98%) while only 28% had greater HIV transmission risk[18]

- In India, high prevalence states of HIV are Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Manipur and Nagpur. These states will make 63% of the total HIV infected persons in India.

- HIV prevalence among FSWs attending STD clinics in Pune was 54% (1993-2002) [19].

- According to ten year study done in Pune among FSWs 34% reported consistent condom use, 52% reported irregular condom use, 14% had never used[19].

- According to study at Surat, 58.5% FSWs had no symptoms related to STDs at the time of examination. Prevalence of different STIs and HIV among FSWs in the Surat red light area is high despite high reported condom use with clients[20].FSWs had 570 client contacts per year[21].

STI Trends in FSWs in developed countries

- In a study conducted in Mexico among 924 FSWs, the prevalence of HIV was 6%, gonorrhea 6.4% , chlamydia13%, and syphilis titers more than 1:8 was 14.2%[22].

- FSWs were more likely to have chlamydia infection(2.9% vs 1.3%). They also have increased prevalence of gonorrhoea (0.8% vs 0.2%,) than normal population. Other conditions such as hepatitis B, hepatitis C, scabies, bacterial vaginosis, candidosis, pelvic inflammatory disease, UTI and abnormal cervical cytology were also higher among FSWs. But the other females were diagnosed with genital warts more often than FSWs. FSWs have increased incidence of reinfection than in other females, notably for chlamydia reinfections (6.6% of infected FSWs became reinfected in 2011 vs 3.4%) and BV recurrences (7.4% vs 3.7%)[23].

- The incidence of STIs was low among decriminalized and regulated sex work and most infections were related to partners outside of work. Frequent screening of sex workers will reduce the chance of workers passing on an STI

  but is expensive[24].

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Sexually Transmitted Infections among FSWs

Even before the first AIDS case diagnosed among FSWs, they were already in the midst of an epidemic of STDs. Core groups such as sex workers and their clients, because of their high rates of partners change are important in the transmission dynamics of all STDs. Some of the common STDs among FSWs are discussed below.

Syphilis

At the height of the U.S Syphilis epidemic in the early 20th century, 25% of all cases of Syphilis were estimated to have been transmitted through commercial sex[25].

The prevalence of latent syphilis that is Rapid plasma reagin of any titer which is confirmed with TPHA was 10.1% and high-titer syphilis of RPR titer ≥1:8 was 5.8% among FSW. The high prevalence of latent syphilis among FSW marks the necessitation for providing periodic syphilis screening and appropriate treatment when it is indicated[26].

Syphilis is also highly prevalent among prostitutes in developing countries. In a group of CSWs in Surat the percentage of TPHA positivity was 22.9%.

In a large group of over 3000 female sex workers in Mexico City the prevalence of Latent asymptomatic syphilis was 8.2%[27]. The prevalence in commercial sex workers in Cameroon and Mauritius was 11.3% and 32% respectively[28].

In a study of 625 female sex workers in Argentina, syphilis was the most common sexually transmitted infection (45.7%%). Syphilis was associated with older age (more than 30 years) , more number of years in sex work , drugs abuse, and a prior history of an STI. In 7.5% coinfection of HBV and syphilis was found[29].

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Epidemiologic analysis from Sub-Saharan Africa showed a transmission possibility in early infectious syphilis of approximately 0.3% from male to female and 0.2% from female to male.

The variable factors that influence the transmission of infections include the number of exposures, the type of sexual activity and the morphology and distribution of lesions in the infected partner[30].

Syphilis and HIV

Many studies have showed significant association between syphilis and HIV transmission. Four fold increase in HIV transmission in syphilis patients was observed in a meta analysis of sixteen studies[31].

HIV patients have high risk of serologically active syphilis[32]. Decline in CD4 cell count and increase in viral load has been observed in HIV and syphilis coinfection. On successful treatment of syphilis, these may or may not revert back to normal[33].

In advanced stages of HIV infection, syphilis may present with atypical features[34]. Primary chancre may be multiple, larger and painful. Primary chancre heals slowly and ulcer may be present during the secondary stage[35].

More rapid progression to neurosyphilis can occur in HIV. They have asymptomatic neurosyphilis more often[36]. So CSF examination should be done at the time of presentation in HIV patients with early syphilis[37].

Treatment guidelines are the same for syphilis with HIV and those without HIV infection in all the stages of syphilis[38]. More frequent clinical and serological follow up is needed (3, 6, 9, 12, and 24 months post treatment)

The diagnosis of syphilis in both HIV infected and non-HIV infected persons is reliably made by the use of dark field microscopy of the exudates from primary (or) secondary lesion. Both the Venereal Disease Research Laboratory (VDRL) and Rapid Plasma Reagin (RPR) tests are commercially available. Early case reports suggesting the unreliable nature of syphilis serology in HIV infected patients has not been substantiated. A four fold decline in titer at 6 months in the patients with late infections is usually consistent with adequate response to treatment.

The development of alternate therapies to penicillin is among treatment advances for syphilis. Long acting Benzathine Penicillin G is still recommended standard therapy for the treatment of syphilis. The recommended alternative therapy for penicillin allergic patients is Doxycycline.

Gonorrhoea

The prevalence of Gonococcal infection in African women is also very high ranging from 20 – 40% . A study from Bangladesh has shown disease positivity in 35.5% of the female sex workers[40].

In India, however over the years there has been a steady decline in its incidence, which may be attributed to improved medical facilities at the primary health level, indiscriminate use of over the counter anti-bacterial drugs for unrelated illness, prophylactic use of antibiotics after sexual exposure and growing awareness about AIDS in the Indian population.

In developing countries, the apparent ratio of male to female cases is 10:1 with 80 – 90% men acquiring infection from commercial sexual workers[41]. A prospective cohort study performed on brothel-based female sex workers who practiced oral sex revealed that 5.2% workers contracted pharyngeal gonorrhoea[42].

The disease is asymptomatic in approximately 75-80% of the women which makes them an efficient reservoir for disease perpetuation among their male contacts[43].

Its incubation period varies from 1-14 days, with an average 2-5 days. Asymptomatic infection occurs at urethra, endocervix, rectum, and pharynx. The primary site of infection in female is the endocervical canal. The organism colonizes the urethra, Bartholin's and Skenes gland and spreads to involve the cervix, uterus, fallopian tube and pelvis whereas vulva, vagina, bladder and upper urinary tract are relatively spared. It causes urethritis, Bartholinitis, Bartholins abscess, cervicitis, proctitis, pharyngitis, conjunctivitis which later leads to complication like skenitis, parametritis, cystitis, Pelvic inflammatory disease , infertility and systemic involvement such as meningitis, conjunctivitis, panophthalmitis, pneumonitis, Fitz-Hugh-Curtis syndrome, septicaemia, arthritis, dermatitis.

In pharyngeal gonorrhoea, disease transmission to sex partner is inefficient and rare. However pharyngeal gonorrhoea is a risk factor for developing disseminated Gonococcal infections[44].

The diagnosis of gonorrhoea continues to be predominantly by gram stain, culture, and PCR. The recommended treatment for uncomplicated gonococccal infection, Inj. Ceftriaxone 250mg I.M as a single dose (or) T.Azithromycin 2g stat which will also cure the co-associated Chlamydial infection.

BACTERIAL VAGINOSIS [BV]

Bacterial vaginosis is the most common abnormal vaginal condition and is the leading cause of abnormal vaginal discharge accounting for up to 48% of cases[45].

In Thailand, 33% of FSWs had BV compared to the 16% prevalence found among pregnant Thai women[46]. BV was diagnosed in only 18% of women hospitalized with complications of AIDS [47]. BV is found in 44% HIV positive commercial sex workers[48,49]. The vaginal swabs collected from FSWs were Gram's stained and analyzed for BV by Nugent's scoring criteria shows 45% positivity[50]. In a study of 100 women with vaginal discharge at Patiala, BV was seen in 48%[51].

Three cohort studies found that women having exposure to new sex partners (or) multiple sex partners had an increased incidence of BV[52]. Gardner and Pheifer et al detected G.vaginalis in the urethra of 79% of male sex partners of women with BV but not in male controls. Risk factors include those with a history of Bacterial STI, increase number of life time sex partners and lower age of first intercourse[53].

BV is the commonest cause of vaginal discharge. Patients present with malodorous vaginal discharge although many are asymptomatic. Non viscous, homogenous, white inflammatory discharge that smoothly coats the vaginal walls, often visible on the labia and fourchette with characteristic odour are the features of BV[54].

Amsels[55] et al proposed criteria for diagnosis of BV. Diagnosis requires three (or) more following features

1. Excessive homogenous uniformly adherent vaginal discharge
2. Elevated vaginal pH >4.5
3. Positive amine test (whiff test)
4. Clue cells (20%)

BV & HIV

Decreased Lactobacilli leading to less H_2O_2 production which is toxic to HIV. Loss of low vaginal pH which may inhibit CD4 activation also increases HIV. BV has also been shown to increase vaginal levels of IL-10 which increases the susceptibility of macrophage to HIV.

Complications of BV are increased rate of miscarriage, pre-term delivery, Low birth weight , Premature rupture of membrane, postpartum endometritis, vaginal cuff endometritis, Pelvic inflammatory disease and abortions.

An inhibitory effect of bacterial amines, putrescine and cadavarine on the cell division and germ tube formation of Candida albicans has recently been reported[56] .

According to WHO, treatment is T.Metronidazole 400mg BD for 7 days (or) T.Metronidazole 2g single oral dose. 30% of patients have recurrence of symptoms within 3 months.

VULVO VAGINAL CANDIDIASIS (VVC)

About 70 -75% of women will have atleast one lifetime episode, with 40 50% suffering a recurrence[57].

A study of HIV/ STD infections among CSWs in Kolkata shows 13.26% were affected with VVC[58].

Risk factors for VVC are increasing use of antibiotics, Oral contraceptive pills, douching, feminine hygiene products and tight non cotton pants. The incidence increases with the onset of sexual activity, use of sponges and IUCDs.

Centres for Disease Control and Prevention had classified VVC[59]

1. Uncomplicated
    - Sporadic or infrequent
    - Mild to moderate VVC
    - Likely to be candida albicans
    - Non immune compromised women

2. Complicated
    - Recurrent VVC
    - Severe VVC

- Non candida albicans'
- VVC in women with uncontrolled diabetes mellitus, debilitation or immunosuppression or those who are pregnant

Typical symptoms of VVC include itching, vaginal discharge, vaginal soreness, vulval burning, dyspareunia and external dysuria. Diagnosis of VVC depends upon demonstration of yeast (septate) in vaginal secretions in 10% KOH mount, culture and PCR. Treatment is by oral T.Fluconazole (150mg single dose) and with topical 2% Clotrimazole cream[58].

VVC and HIV

Recurrent vulvovaginal candidiasis was described as a presenting marker of underlying HIV. There was increased incidence of VVC and trichomonas infections with fall of CD_4 cell count. A study assessing the effect of treatment of vaginal infections on the shedding of HIV in 98 patients with VVC showed that vaginal HIV RNA decreased after treatment.

Treatment of VVC resulted in a 3.2 fold reduction in concentration of HIV in vaginal secretions and a 3 fold decrease in the likelihood of detecting HIV infected cells [60]. In another prospective study of 205 HIV positive women, it was shown that the risk of developing symptomatic VVC increased 6.8 times for women with CD_4 cell count less than 200 cells/μL[61].

TRICHOMONAS VAGINALIS VAGINITIS [TVV]

T.vaginalis is almost exclusively transmitted by sexual intercourse. Approximately, 174 million people worldwide are infected with this parasite annually[62]. Prevalence rates have ranged from 5-10% in general population and 50-60% in commercial sex workers. The highest prevalence occurs during the years of peak sexual activity, in patients attending STD clinics and in commercial sex workers.

A study of HIV/ STD Infections amongst commercial sex workers in Kolkata shows the prevalence of 23.64%[58]. A similar study on prevalence of HIV and Sexually Transmitted Infections among low income female commercial sex workers in Mangolia had a prevalence rate of 28%. A study done at Nigeria shows the prevalence of 21.9% among the commercial sex workers[63]. The prevalence of Trichomoniasis varies from 5.7 to 60.6% in different parts of India.

T.vaginalis ingest and readily kills Lactobacilli and other bacteria in-vitro and thus it seems unlikely that trichomonads serve as **"Trojan Horse**" vectors, which ingest other STDs pathogens and carry them undamaged into a new human host[64]. Older literature suggests that some treatment failures in patients with gonorrhoea resulted from protection of viable gonococci within Trichomonads[65].

However, when T.vaginalis were mixed with suspension of N.gonorrhoea, M.hominis (or) C.trachomatis in-vitro, most gonococci were killed within 6 hours, and all Mycoplasmas were killed within 3hours[65]. 30-50% of women with gonorrhoea also have had T.vaginalis.

Trichomoniasis is a urogenital infection. T.vaginalis is isolated most often from lower urogenital sites. In women these sites include the vagina, cervix, urethra, bladder, bartholin's and skene's gland. In men the organism has been isolated from the anterior urethra, external genitalia, prostate, epididymis and semen.

The organism is seen in 14-60% of male sex partners of infected women and 67-100% of female partners of infected men[66.]. The incubation period for T.vaginalis infection is between 4-28days. Symptomatic women present with vaginal secretion were usually copious, homogenous, frothy, and malodorous with pH of 4.5 and yellow green colour. On colposcopy colpitis macularis (or) strawberry cervix is visualized. Rarely present with lower abdominal pain, post coital spotting. Most common manifestation in men is urethral discharge (or) urethritis.

Diagnosis is done by demonstration of organism in wet mount of vaginal discharge, phase contrast microscope, culture, immunological and molecular methods.

Treatment is T.Metronidazole 400mg BD for 7days (or) single dose T.Metronidazole 2g orally. Partner treatment is justified with protective sex till completion of the treatment.

Herpes genitalis

Herpes simplex infection is the most common cause of infection related genital ulceration worldwide. The incidence has increased manyfold in the last two decades and has assumed major public health significance especially because of association with HIV infection. The reasons for its increase are the decrease in the treatable bacterial STDs, the high recurrence rates and asymptomatic recurrence with transmission in the absence of symptoms[67].

Most cases are caused by HSV-2; however the incidence of genital herpes caused by HSV-1 is increasing[68] . The recent increase in isolation of HSV-1 from genital lesions of herpes is probably because of greater frequency of practice of fellatio and cunnilingus. The transmission of HSV-2 is more frequent in women from men than in men from women. The higher rate of asymptomatic infection in men may be a factor in the higher risk of male to female transmission.

A recently published report indicates that bacterial vaginosis appears to enhance the risk of acquisition of genital herpes simplex infection[69].

Risk factors for genital HSV infections include multiple sex partners, advent of sexual activity at 17years of age or younger, history of other STDs, HIV infection, history of undiagnosed genital lesions or discharge, relatively low educational level, low socio economic status and partner with diagnosed genital HSV infection.

Genital herpes caused by HSV-2 is recurrent in 90% or more of those infected and 88% have atleast one recurrence during 12 months after the initial episode. The mean rate of recurrence in HSV-2 genital infection is 0.3 to 0.4/ month[70]. The mean time from onset of lesions to complete healing is longer in women (20days) than in men (16.5days).

Genital Herpes and HIV

Genital herpes is the most common STD in HIV Sero-positive individuals. The frequency of HIV Sero-positivity in genital herpes patients has varied from 0.5% (1995) to 20% (1999) in various parts of India[71].

Genital herpes in immuno-compromised HIV patients tend to be more severe, extensive, and difficult to treat and for most of them, recurrence are also frequent.

Patient with recurrent Genital herpes may experience shame and guilt or withdrawn from social interaction and intimate relationship because of concerns about undesirability, disapproval and rejection, leading to increased isolation and withdrawal[72].

Genital herpes infections cause a substantial amount of morbidity in FSWs with symptoms ranging from recurrent itchiness, redness or burning sensation to blisters and sores and genital neuropathic pain.

These manifestations can involve labia majora, labia minora, the clitoris, the perineum, at the introitus, cervix, anus or rectum, buttocks and mons pubis. Definitive diagnosis is often difficult because it requires isolation by culture of HSV from the affected area; laboratories will routinely identify the subtype using direct fluorescent types – specific antibody of HSV from clinical specimen. Serologic testing might be helpful to rule out infections because the Sero-positivity of HSV-1 and HSV-2 in the general population is about 70% and 22%, respectively. Recent data

demonstrate that asymptomatic viral shedding is 4 times more common in HIV Sero-positive than in HIV Sero-negative women.

Genital ulcers facilitate HIV transmission through the reduced epithelial barrier and infiltration of CD^{4+} lymphocytes in herpetic lesions that are possible targets for HIV attachment and entry. There is a transactivation between both HSV and HIV infections.

The most important recent advances in the treatment of genital HSV have been the US FDA approval of Tab.Valacyclovir 500mg orally twice daily for 3 days for recurrent infections and the recent demonstration of the efficacy of Tab.Acyclovir, 800mg orally 3 times per day for 2 days[73].

Anogenital Warts

Anogenital warts have been recognized as a disease entity for many centuries. They were certainly recognized by early Greek and Roman Physicians, such as Hippocrates and Galan. The term 'Condyloma' is derived from the ancient Greek, meaning 'a round swelling adjacent to the anus'. The addition of the suffix 'accuminate' is a relatively new feature, appearing towards the end of the 19^{th} century. In 1980, Gissman and Zarhausen, has characterized HPV from a genital wart, thus defining the etiological agent for the development of Anogenital warts.

The prevalence of genital warts in India has been reported to be 5.1% to 25.2% of STD patients[74]. In a report by Arora et al, the incidence of Anogenital warts had increased from 7.2% to 8.8% among the HIV infected patients over a period of 5 years[75].

Genital HPV infections are transmitted primarily through sexual contact. The infectivity of HPV between sexual partners is estimated to be 60%. Digital transmission, perinatal transmissions have been reported. Almedia[76] et al showed "one way cross reactivity" between cutaneous and Anogenital warts. The cutaneous warts are auto-inoculable on to genital mucosa, whereas the genital warts are not able to produce any lesions on the glabrous skin. The lesions appear after the incubation period of 1-8 months with an average of 3 months. In women the common sites involved are posterior part of the introitus, labia, perineum and perianal area. Vagina and cervix are affected more commonly in sub-clinical infections. Risk of transmission to malignant lesion is reported.

Only clinically apparent and cytologic alterations remain the most frequently applied diagnostic criteria for genital HPV[77]. There is no evidence to support the use of HPV typing of the Anogenital warts; it does not add any information that is clinically useful. The sensitivity of Pap smear is poor, though specificity is very high (90%). Serology has little value in the diagnosis because of low sensitivity and low specificity.

Molecular technique is considered as gold standard but they are too cumbersome and slow for routine use. It is implied only for research purpose and for quality control.

Treatment for external genital warts includes provider (or) patient applied therapy such as liquid Nitrogen, Podophyllin 25%, TCA 90%, Imiquimod 5% (or) 0.5% Podofilox gel. Patient applied topical applications appear more efficacious on mucosal sites and other areas that are less keratinized. One advantage of 5% Imiquimod is that it might be associated with a reduced recurrence rate because it activates host immunologic mechanism to clear infections rather than simply ablate the wart.

HIV

With continuing high levels of other STDs amongst some group of prostitutes, the potential for epidemic spread of AIDS was clear as soon as the mode of HIV transmission was understood. High levels of HIV infection have been found among prostitutes in countries where the virus is predominantly transmitted through hetero-sexual contact.

Relationship between the vaginal ecosystem and HIV

H_2O_2 producing Lactobacilli were cidal to HIV, the first clinical data suggesting that the presence of vaginal Lactobacilli may protect against hetero-sexual transmission of HIV. Women with Lactobacilli predominant

vaginal flora as assessed by Gram's stained vaginal smears, had a 14% prevalence of HIV and women with reduced Lactobacilli by vaginal smear, had a 40% increase in the seroprevalence of HIV[46] . Women with severe Bacterial vaginosis had a 90% increased risk of HIV.

STIs in HIV Infection

Wasserheit[78] has called this relationship 'Epidemiological Synergy' a phrase that emphasizes that STIs enhance HIV-1 transmission. In a study done in STD clinic, Pune, India[79] patients who had GUD were more than 4 times as likely to seroconvert as those without GUD. HIV-1 DNA was significantly increased in cervico-vaginal fluids of patients with STIs. A week after treatment for STI, detection of HIV-1 in their secretions decreased from 42% to 21%. Non ulcerative STIs increases risk primarily for the receptive partners – female from male[80].

Chlamydia trachomatis increases the replication of HIV-1 through the generation of reactive oxygen products secreted by granulocytes[81]. Treponema pallidum lipoproteins have been shown to increase HIV-1 replication. Mostad et al[82] noted a significant increase in detection of HIV-1 swab samples from women with Gonococcal cervicitis and vaginal candidiasis but not in those with Trichomoniasis (or) Chlamydial infections. In tissues co-infected with HSV-1, HIV virions appear to be able to infect keratinocytes lacking CD_4 receptors which are not usually vulnerable to

HIV infection . In-vitro studies have shown that intracellular HIV-1 tat mRNA can transactivate HPV type 16 E6 and E7, an action that is important in development of squamous cell carcinoma.

HIV and FSWs in India

Surveillance for HIV infection was initiated in India by ICMR in late 1985 as a part of AIDS task Force; Anti-HIV antibodies were first detected among sex workers from Chennai in 1986[88].

Human Immunodeficiency virus infection is the most important STD associated with sex work. Sex workers and their clients are major groups at risk of acquiring and transmitting HIV. Genital tract infections and inflammation probably increase HIV shedding in the female genital tract, rendering a woman more infectious to a sexual partner.

In 2006, India had 2.5 million people living with HIV/AIDS. HIV epidemic is highly prevalent among high risk groups and female sex workers.

0.34% is the seroprevalence of HIV in India. In FSW prevalence of HIV was 5.06%[83]. The transmission of HIV has been linked to repeated STIs and high risk sexual behavior.

The prevalence of HIV varies in different locations. In Chennai it was 2.4%[83].. In majority of cities of Maharashtra, 36-39% prevalence was found. Among 8 cities of Bulgaria, there was very low HIV prevalence of 1%. It was 3.2% among FSWs in Argentina[84]

In a study from Nagaland among FSWs factors independently associated with HIV are injecting drugs, early age of initiation of sexual intercourse, previous STI and having been widowed[85]. In a study from Andhra Pradesh, it was found that residential instability is associated with unprotected sex, sexual victimization and high risk for acquiring HIV[86].

Variation in the structure of sex work is an important factor in determining HIV prevalence among FSW in India. HIV risk was greater for brothel based FSW, public place based FSW and unmarried or separated FSWs.

It has been shown that promotion of condom usage was found to be effective in reducing HIV infection among FSW. Consistent condom use of 9% and 16.4% with regular and occasional sexual clients was found in a study from Andhra Pradesh[86].

23.5% of HIV infection in women was attributable to FSW in India[87]. Intervention strategies should be intensified towards FSWs together with other strategies to stop HIV spread and to reduce the burden of HIV.

HIV Transmission

Considering that many FSWs and clients in India are infected with a STD, proposed best and high estimates 0.0011 and 0.002 HIV transmissions per unprotected coital act[88].

The sexual transmission of HIV between FSWs and clients account for 44% to atleast 68% of HIV infections among Indian adults.

A 2003 survey reported HIV prevalence of 4% among FSWs in Chennai in 2004[89]. India's epidemic seems to be following the so called Type 4 partner. The epidemic shift from the highest risk group FSWs (core group) to the general population through their clients (bridge population).

It is likely that anal intercourse precedes atleast two modulates of infection:

1. Direct inoculation into blood in cases of traumatic tears in the mucosa.
2. Infection of susceptible target cells, such as Langerhan cells in the mucosal layer in the absence of trauma.

Vulnerability of FSWs to HIV

Women are biologically more susceptible to HIV infection than men. Male to Female transmission of HIV is 2-4 times more efficient than female to male. This is because women have a larger mucosal surface exposed

during sexual intercourse. Poverty, lack of education and limited income earning opportunities often propel women to commercial sex, significantly increasing their risk of infection. There in for example a sharp increase in HIV prevalence rates among CSWs in Mumbai from 1% to 5% between 1987-1993. The risk of HIV transmission is known to increase with the number of male partners a sex worker has intercourse within the course of a day work. Clients' unwillingness to use condoms further accentuates women's risk. Many STDs in women are asymptomatic and therefore less likely to be recognized and multiplies the risk of HIV infection by 300 – 400%. Hence specific interventions targeting FSWs should also be included in the control of HIV and STDs.

Oral sex is a much less efficient mode of transmission of HIV than receptive anal intercourse.

Prevention of STDs among FSWs

Given the importance of sex workers and their clients in STD epidemiology, a key component of STD/ HIV control strategies should be intervened among these groups.

Two general approaches to interventions are possible.

1. Directed at sex work
    - Criminalizing prostitution

- Penalizing clients of prostitutes
- Regulating legalized prostitution[90]
- Reducing the supply of prostitutes
- Reducing the demand for prostitutes

2. Directed at reducing STD transmission
    - Decreasing STD prevalence in sex workers through screening, early diagnosis and treatment.
    - Decreasing STD transmission from sex workers to clients and from clients to sex workers

But prostitution will not disappear as a result an act of parliament or a police crackdown. Instead it makes the condition worse by moving to less visible places and making it harder to find for the purposes of health intervention.

Prevention of HIV/ STIs through sexual abstinence is a desirable but impractical objective[89]. Therefore programmes must emphasis on safer sexual behaviours like [91]

- Reduction in the number of sexual partners
- Avoidance of risky sexual practices

- Where indicated the correct and consistent use of barrier method such as condoms
- A change towards appropriate health care seeking behaviour where infection is suspected

Decreasing the transmission of STDs is mainly done by using condoms. A study among CSWs has shown that those who had access to both male and female condoms had lower incidence of STIs.

Policy planners all over the world have realized that efforts to increase condom use are a good, social, economic and health investment.

Decriminalizing prostitution may prove to be an important public health intervention which would improve the control that prostitutes have over their own work and access that they have to medical care. Effective interventions can promote the practice of safer prostitution which will reduce the contribution of prostitution to epidemics of infectious disease[92] .

Aims and objectives

AIM OF THE STUDY

1. To study the pattern of Sexually Transmitted Infections among Female Sex Workers.

2. To study about the age distribution, socio economic back ground, educational level and marital status among the FSWs.

3. To study the sexual behaviour pattern among Female Sex Workers

Materials and Methods

MATERIALS AND METHODS

STUDY DESIGN

Cross sectional study

SAMPLE

The study population comprised of FSWs attending the Institute of Venereology Government General Hospital, Chennai from 1 st November 2016 to August 31, 2017 .

The majority of the patients were referred by non governmental organizations and vigilance home apart from self referral and referred by other medical departments.

During the study period a total of 100 FSWs were registered and observed.

METHODS

The study patients were interviewed regarding their age, educational status, marital status, presenting complaints, sexual history, past history of venereal diseases and their condom use.

All the patients were counseled on STD/ HIV, genital hygiene, sexual practices, regular treatment and follow up. They were given pre and post test counselling.

All the patients underwent a complete physical examination and genital examination. Except antenatal women and women during menstruation, other patients were examined with Cuscos bivalved self retaining vaginal speculum. All these patients were clinically analyzed for the genital manifestations and supported by laboratory diagnosis.

Screening for sexually transmitted diseases was done. Serological tests for syphilis including blood VDRL and TPHA were performed.

Patients were sent to VCTC for screening HIV. Blood was also collected for HBsAg and Anti HCV antibodies.

In case of genital discharge the following tests were done

- pH of the discharge
- Whiff test by adding few drops of 10% KOH (Potassium hydroxide) to the genital discharge.
- Wet film with one drop of normal saline for Trichomonas vaginalis and clue cells.
- 10% KOH wet mount preparation for Candida albicans and culture with SDA (Saborauds Dextrose Agar) for suspective cases.

- Grams stain to identify Neisseria gonorrhea from endocervix, Lactobacillus, clue cells and Candida hyphae from vaginal discharge.

In addition to the routine examination of urine, culture of Neisseria gonorrhoea from urine specimen and endo cervix was done.

Routine baseline laboratory analysis including complete blood count, urine for albumin, sugar deposits, ultra sound abdomen were done for all patients. Liver function test, Renal function test, Random blood sugar, chest x-ray, ECG, sputum smear for AFB, Mantoux test, blood and urine culture sensitivity were also done for the needed patients.

In needed symptomatic patients' opinion from concerned specialists such as Dermatology, Obstetrics & Gynecology, Dental, Ophthalmology, Chest clinic, Cardiology, Neurology, Nephrology, Urology and Gastroenterology were obtained. Patients were offered standard treatment according to clinical condition and prophylaxis for opportunistic infections.

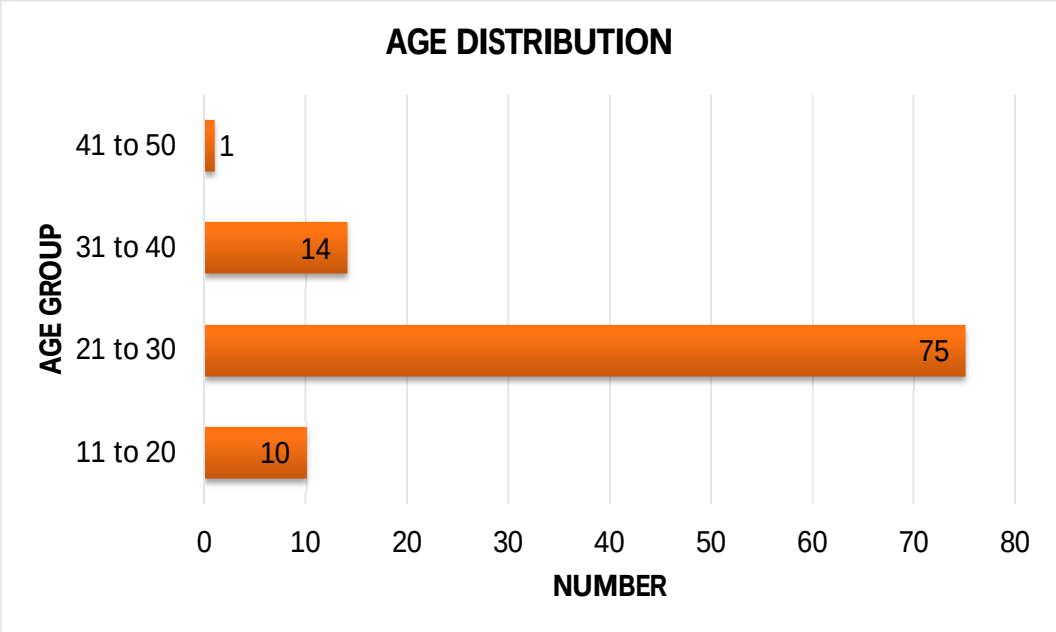
Results

RESULTS

Total number of FSWs in the study group = 100

Table 1: Age distribution of FSWs in the study group (n=100)

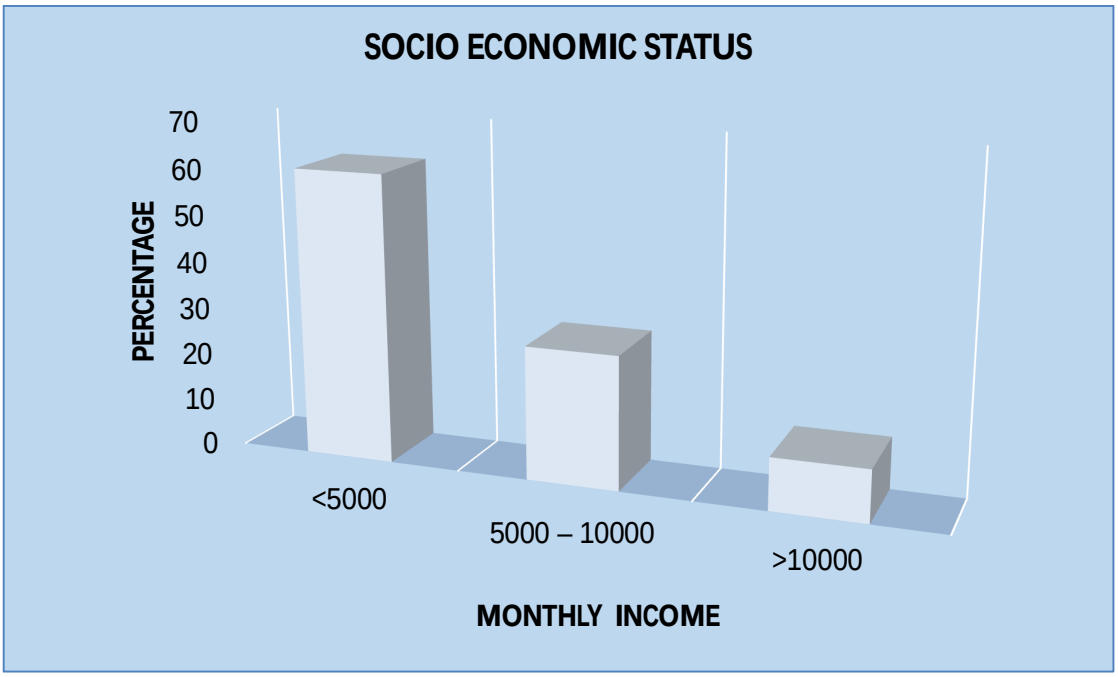
AGE GROUP	NUMBER
11-20 years	10
21-30 years	75
31-40 years	14
41-50 years	1



Majority of FSWs were in the age group of 21-30(75%). The youngest and oldest FSWs encountered in the study were 14 and 42 respectively

Table 2(a): Socio- Economic status of FSWs (n=100)

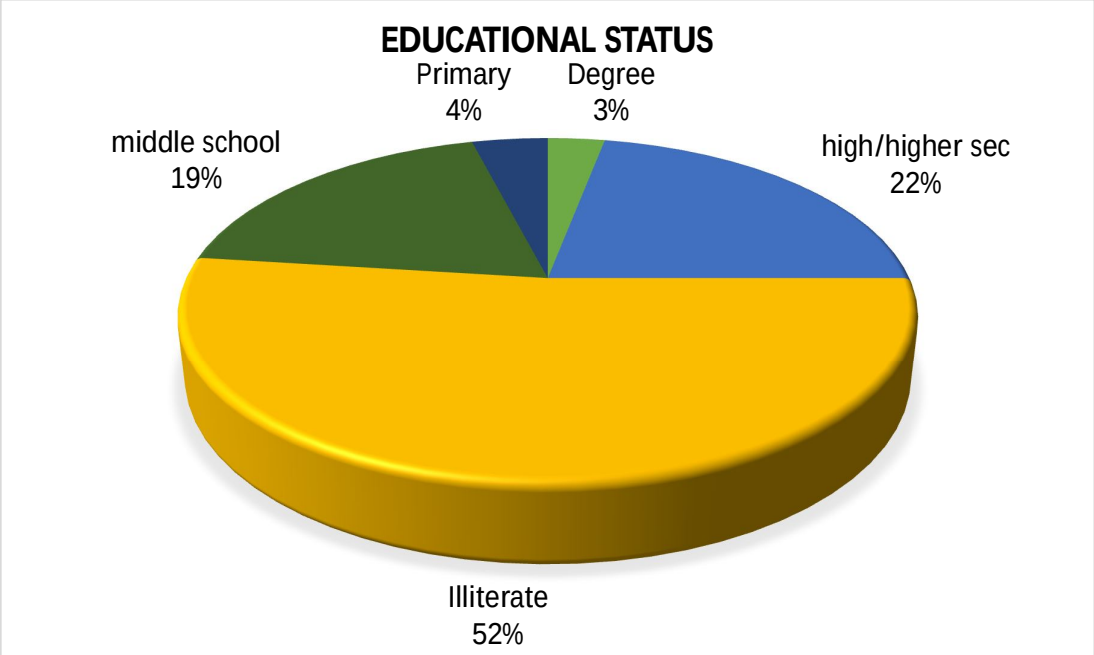
Monthly Income (in rupees)	Total Number
<5000	61
5000 – 10000	28
>10000	11



Majority of the FSWs belonged to lower socio-economic status (61%) i.e. less than Rs.5000 per month. This shows poverty was the main cause for sex trade.

Table 3: Educational status among the FSWs (n=100)

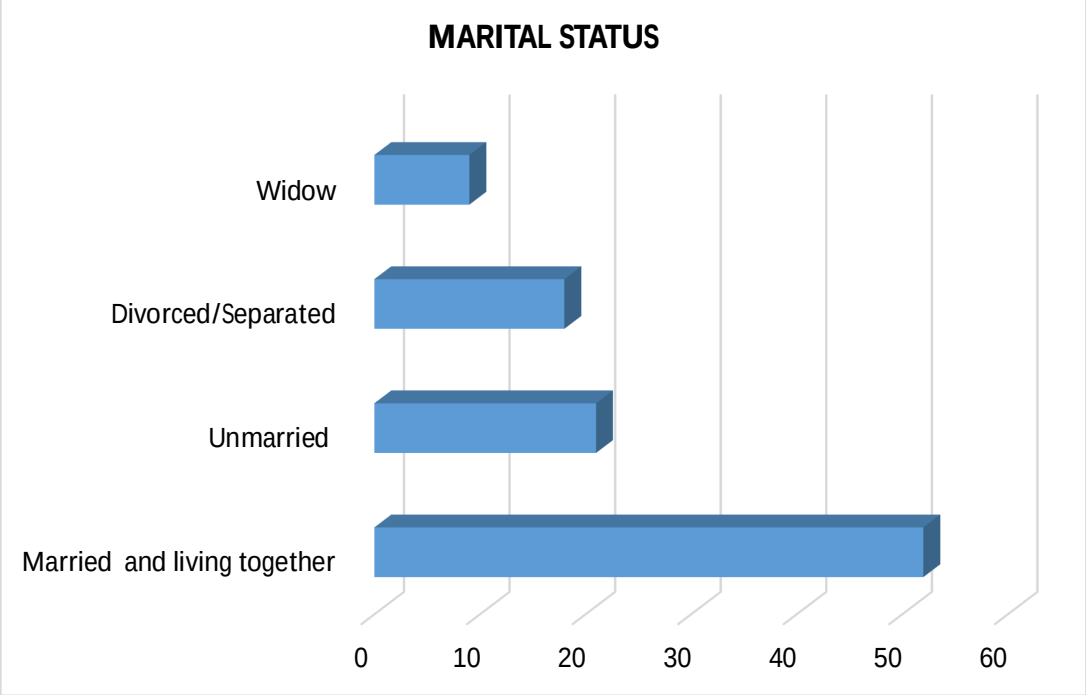
Education	Total Number
Degree	3
High school/higher secondary school	22
Illiterate	52
Middle school	19
Primary	4



52% of FSWs were uneducated in this study

Table 4: Marital status (n=100)

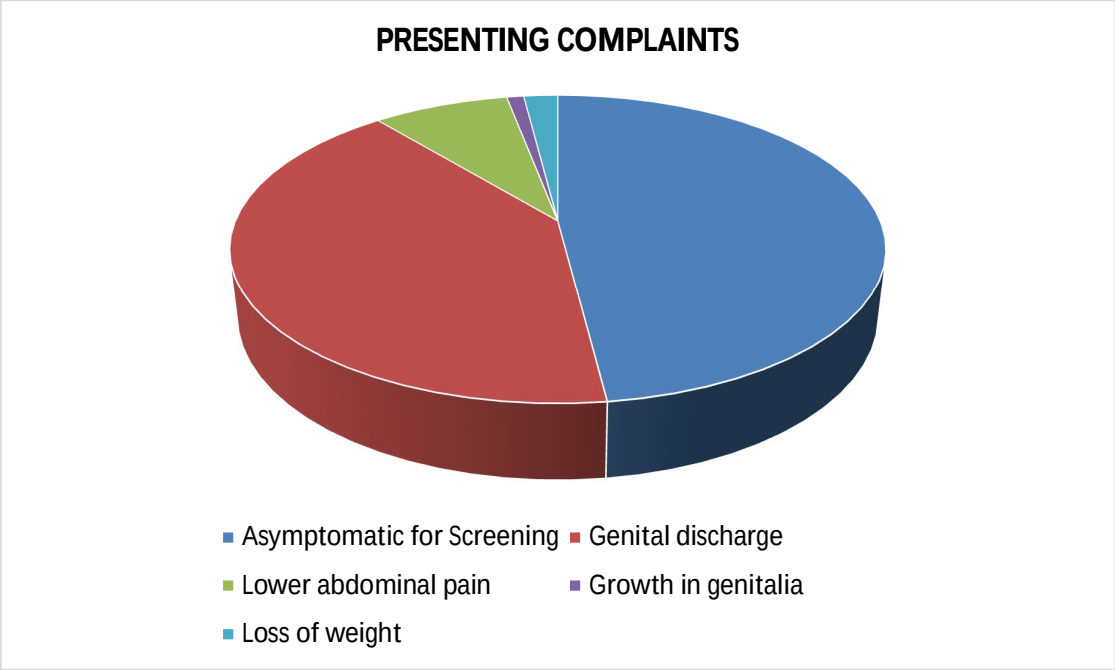
Status	Number
Married and living together	52
Unmarried	21
Divorced/Separated	18
Widow	9



In this study the ratio of FSW married and living together (52%) to those FSWs living single (unmarried / widow / separated) is almost equal (48%).

Table 5: Presenting complaints of the FSWs (n=100)

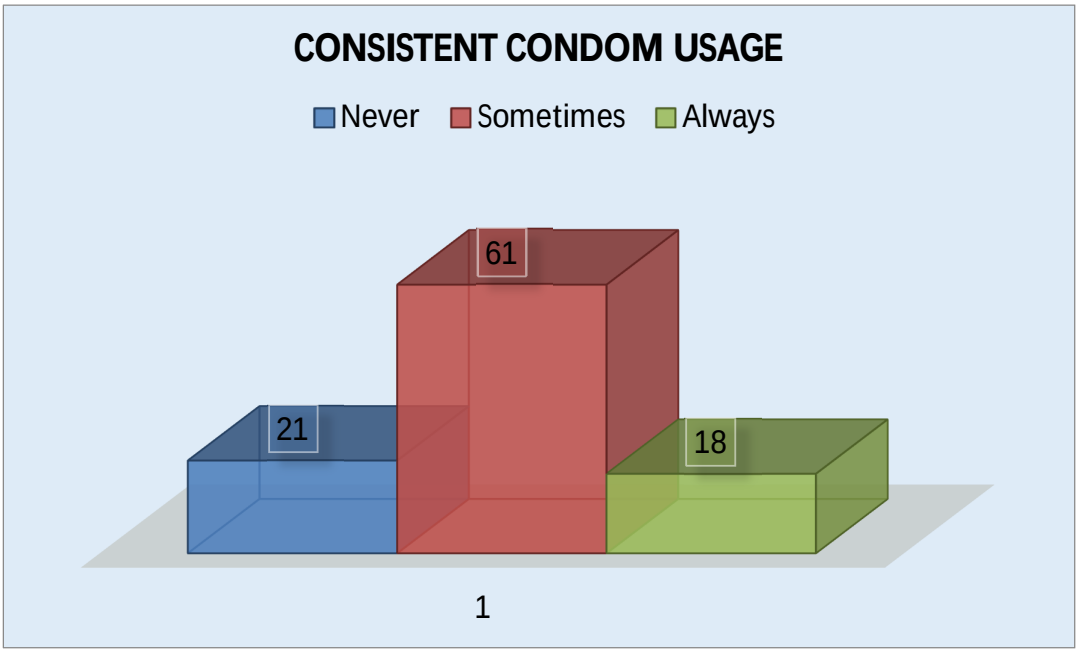
Presenting Complaints	Number
Asymptomatic for Screening	48
Genital discharge	41
Lower abdominal pain	8
Growth in genitalia	1
Loss of weight	2



Majority of the FSWs had visited the STD clinic for screening of STIs(48%). Genital discharge (41%),Lower abdominal pain (8%), were the other common complaints.

Table 6: consistent condom usage among FSWs (n=100)

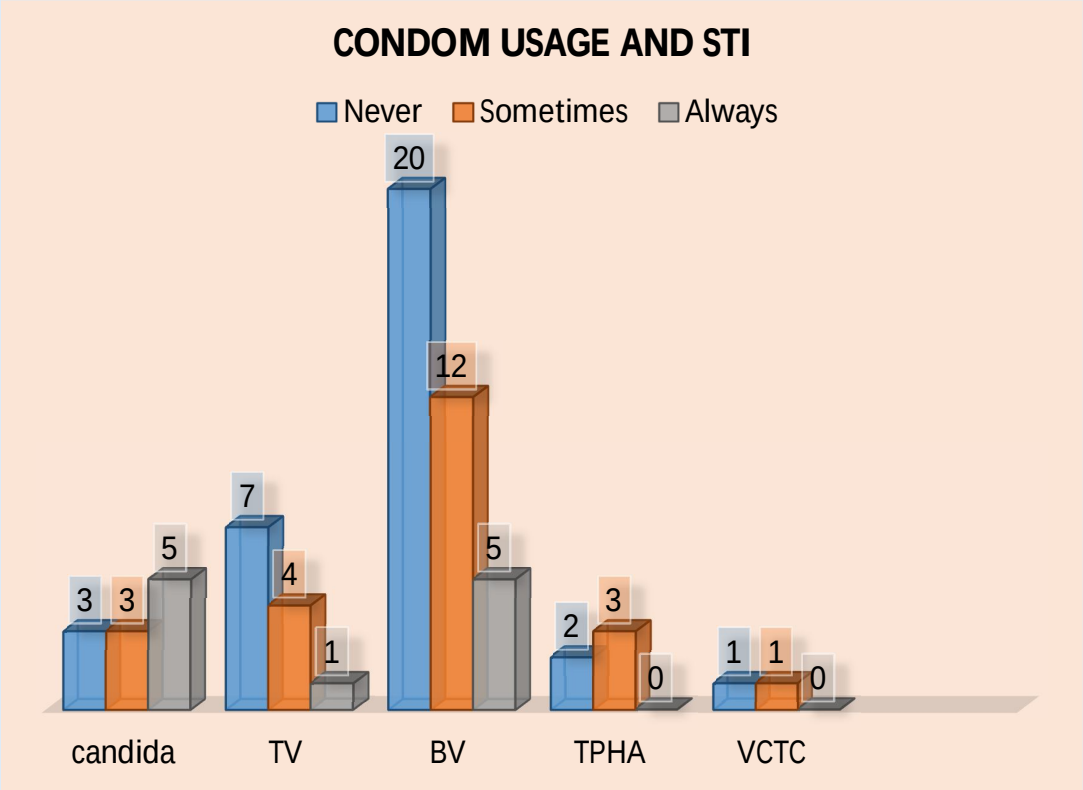
Number of Partners who use condoms	Number
Never	21
Sometimes	61
Always	18



In this study, consistent condom usage is present in 61% of clients of female sex workers.21 % clients of FSWs had never used condoms and 18% clients of FSWs had used condoms irregularly.

CONDOM USAGE AND STIs

Condom usage	Candida	TV	BV	TPHA	VCTC
Never (21)	3	7	20 (95%)	2	1
Sometimes (18)	3	4	12 (66%)	3	1
Always (61 FSWs)	5	1	5	3	0

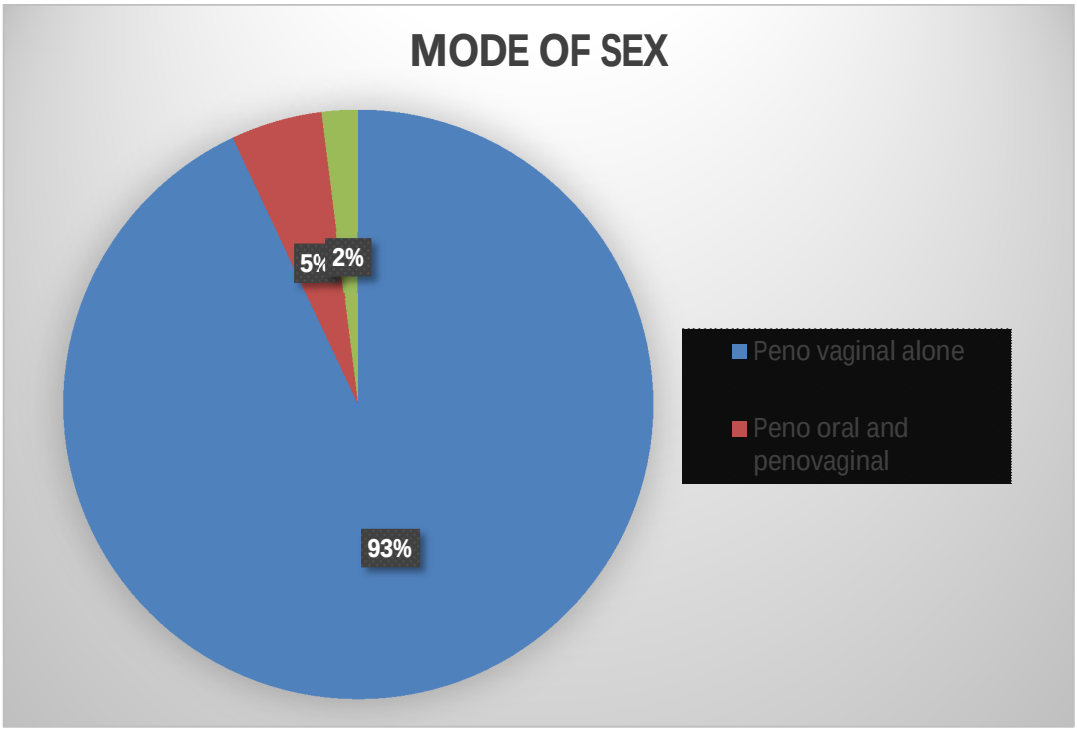


In this study most of the sexually transmitted infections are common among the FSWs whose clients never used condoms. Bacterial vaginosis being the most common STI affecting 20 out of 21 patients in this group(95%) followed by trichomoniasis (66%).

Vulvovaginal candidiasis was the commonest genital infection in those FSWs whose client always used condom and this group have no syphilis/HIV patients

Table 8: Mode of sex (n=100)

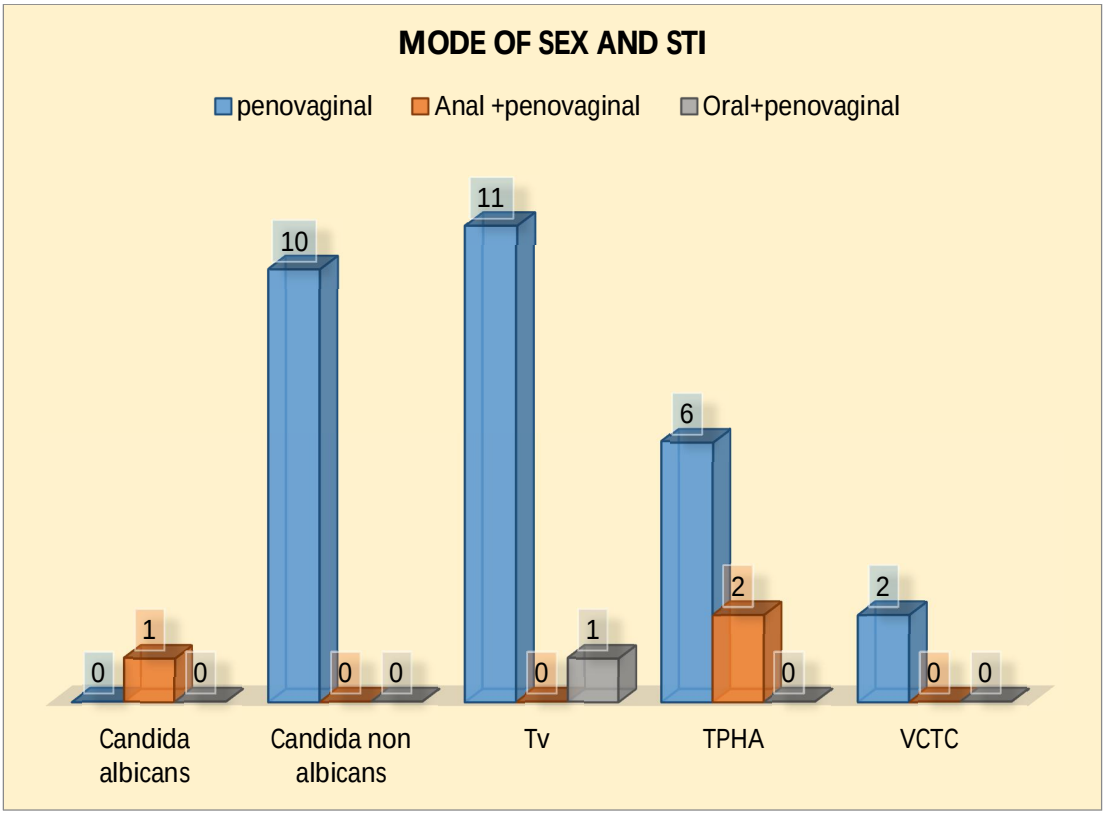
Mode	Number
Peno vaginal alone	93
Peno oral and penovaginal	5
Peno anal and penovaginal	2



In this study all the FSWs had peno vaginal as the primary mode of sex, but 5 (5%) practised peno oral route and 2 (2%) had peno anal route along with penovaginal route

Table 9 Mode of sex and STIs

Mode of sex	Candida albicans	Candida non albicans	TVV	TPHA	VCTC
Penovaginal	0	10	11	6	2
Anal + Penovaginal	1	0	0	2	0
Oral + Penovaginal	0	0	1	0	0



In this study penovaginal being the most common(100%) mode of sex, most of the STIs and HIV positivity are common in this group.11 of the 12 trichomonas vaginalis vaginitis are in this group.

Both of the FSWs who practiced anal sex in addition to penovaginal intercourse had TPHA positivity (100%)

Table 10 : Last sexual contact

Last sexual contact	Number
<=1wk	22
>1wk to <=1month	49
>1month to <=1year	27
>1year	2

In this study, majority of the FSWs(71%) had their last contact less than a month ago. Only 2% had last contact 2 years back. This implies that most of the FSWs were sexually active recently which can lead to high rates of transmission of STIs.

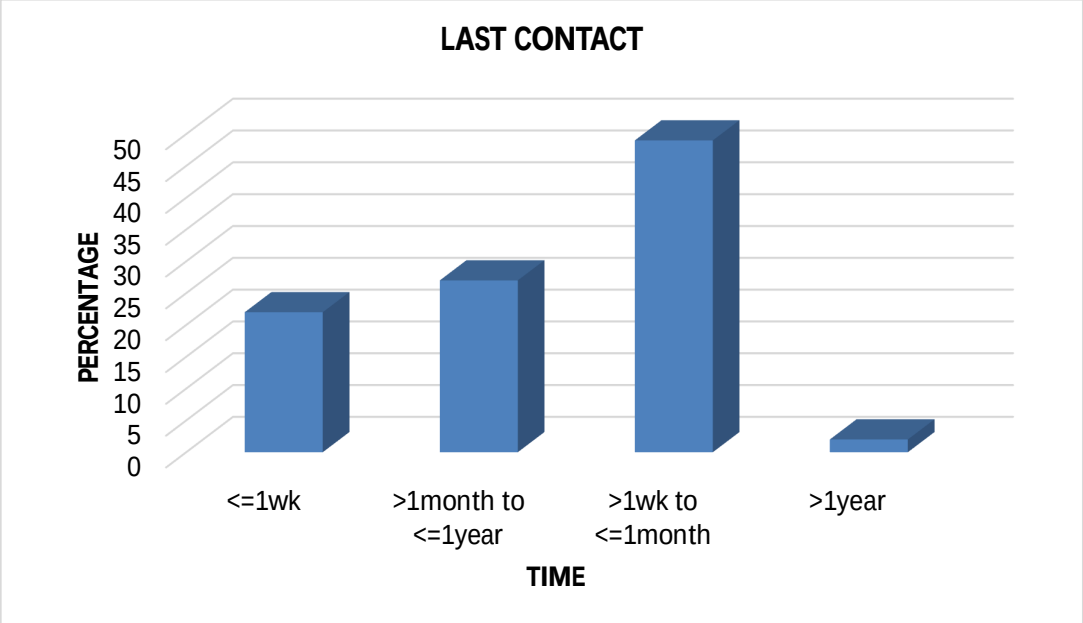
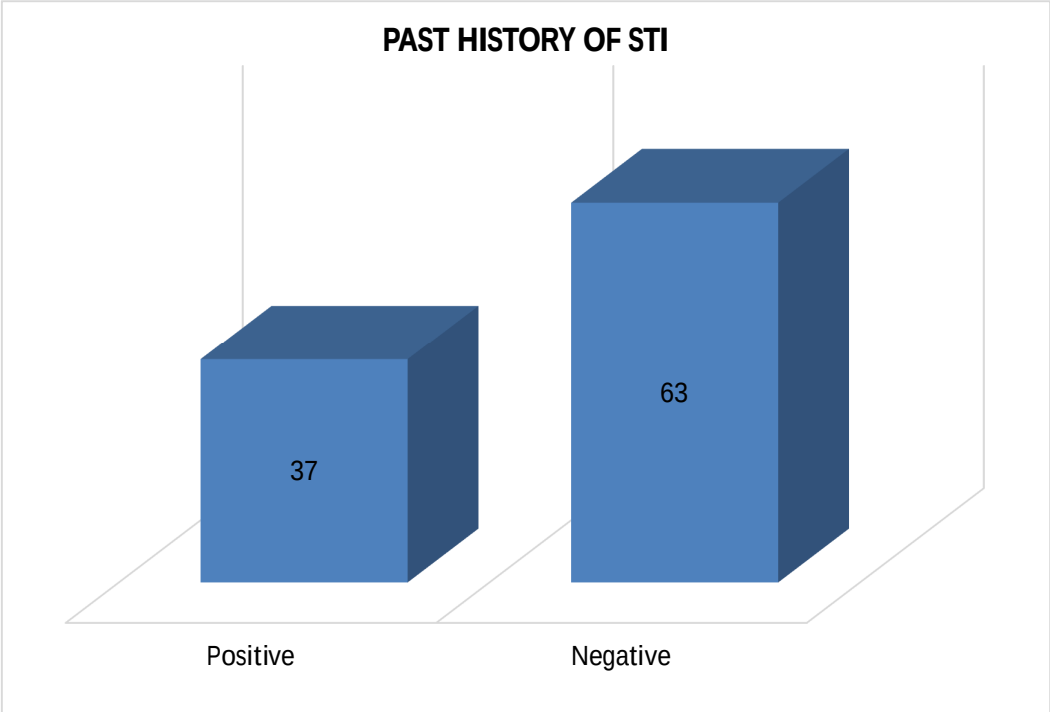


Table 11: Past history of STIs

Past History of STIs	Number
Positive	37
Negative	63



In this study 37% of the FSWs had previous history of STI.

Table 11a Distribution of past STIs

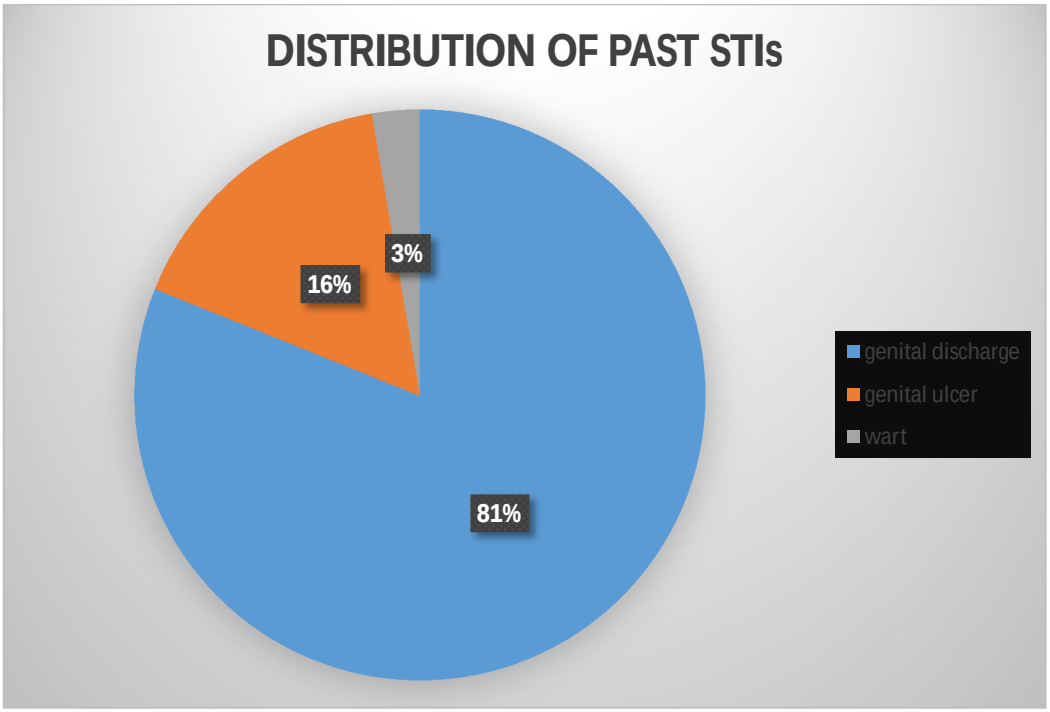


Table 12: STD & HIV awareness

AWARENESS	Number
Positive	72
Negative	28

In this study majority of the FSWs had the awareness of AIDS and their preventive measures (72%).

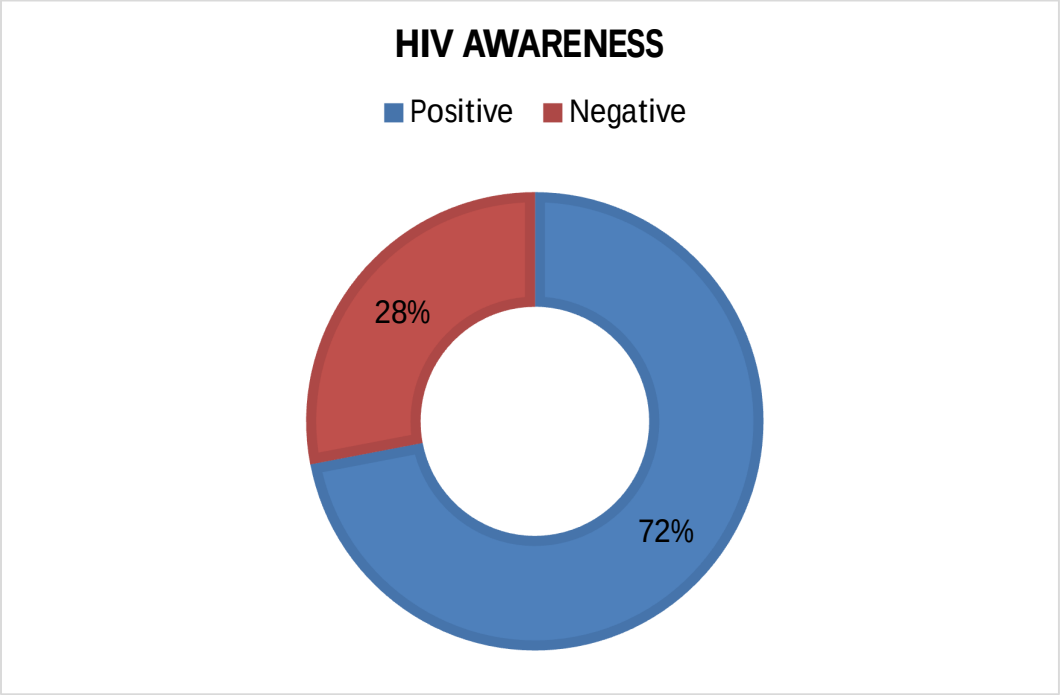
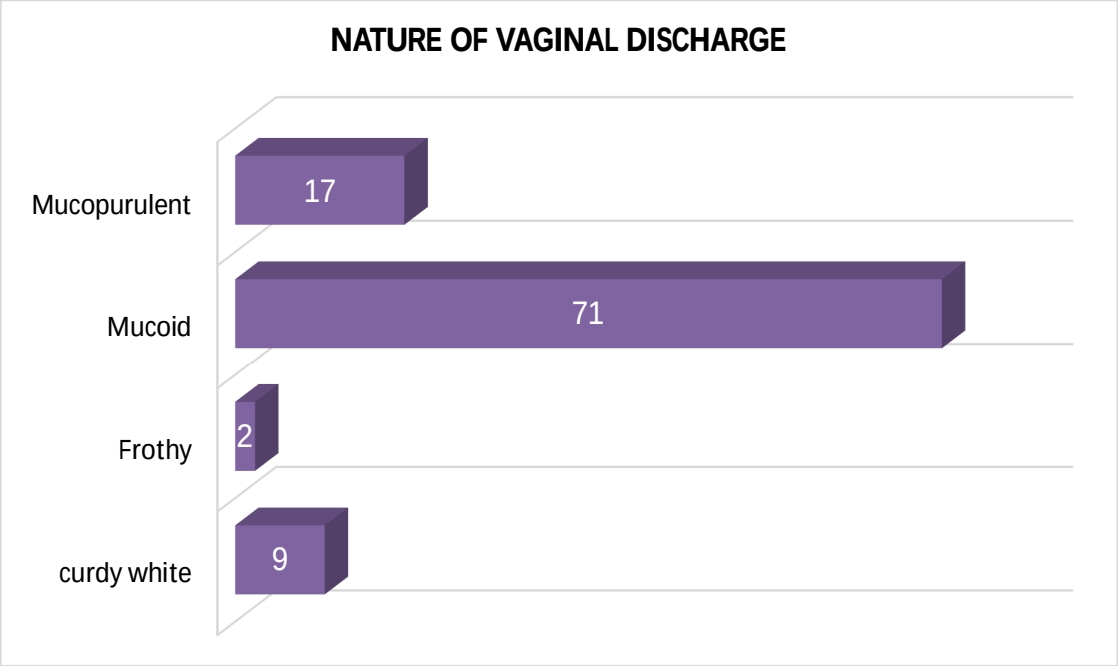


Table 14: Nature of Genital discharge among the study group (n=100)

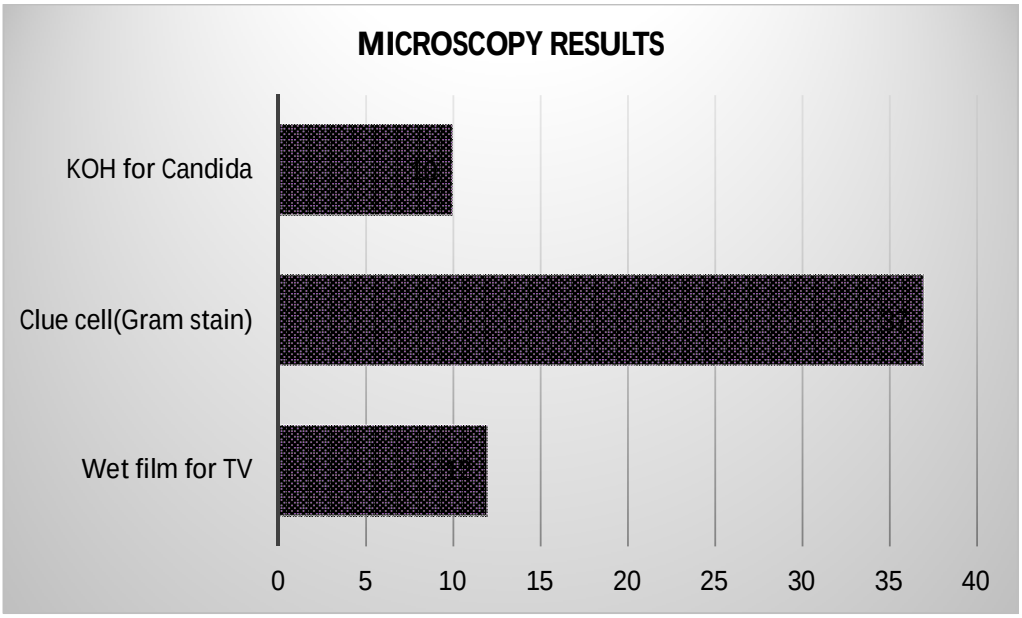
Nature of genital discharge	Total Number
curdy white	9
Frothy	2
Mucoid	71
Mucopurulent	17
No discharge	1



In this study most of the FSWs had mucoid discharge (71%) while 17% of them had mucopurulent discharge 9% had curdy white discharge. Only two of them had frothy discharge.

Table 15: Results of investigation in the study group (n=100)

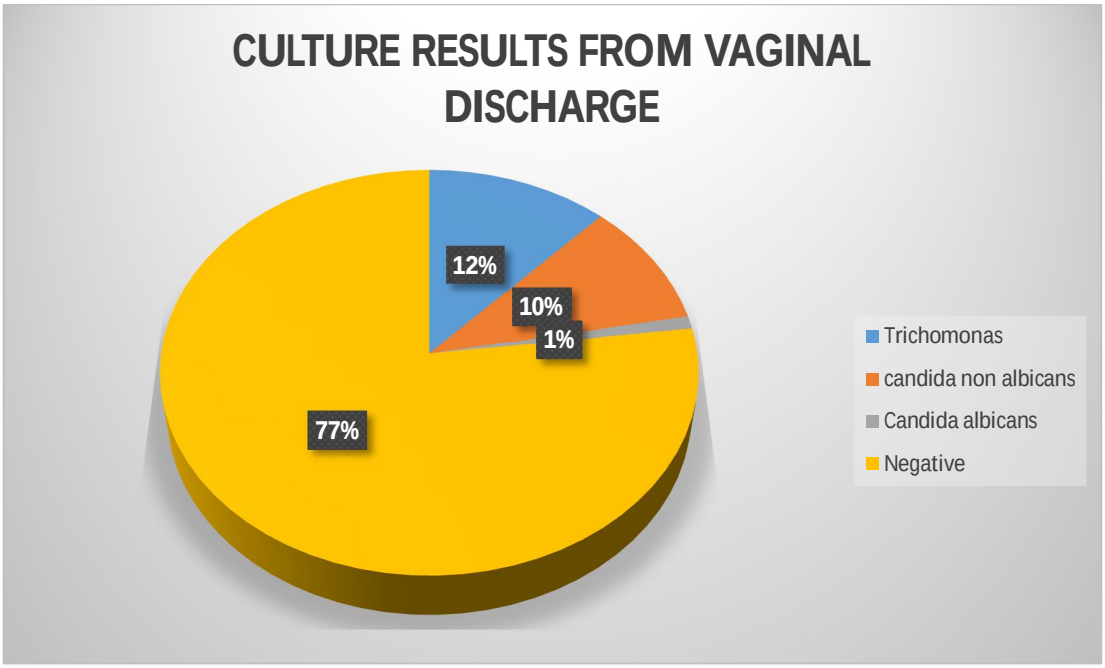
Microscopic examination of vaginal discharge	Positive Result
Wet film for TV	12
KOH for Candida	10
Clue cell(Gram stain)	37



In this study wet mount showed Trichomonas vaginalis in 12 patients .Grams smear of the vaginal discharge showed clue cells in 37%. 10 FSWs showed pseudohyphae and spores in 10% KOH mount.

Table 16 .culture results from vaginal discharge

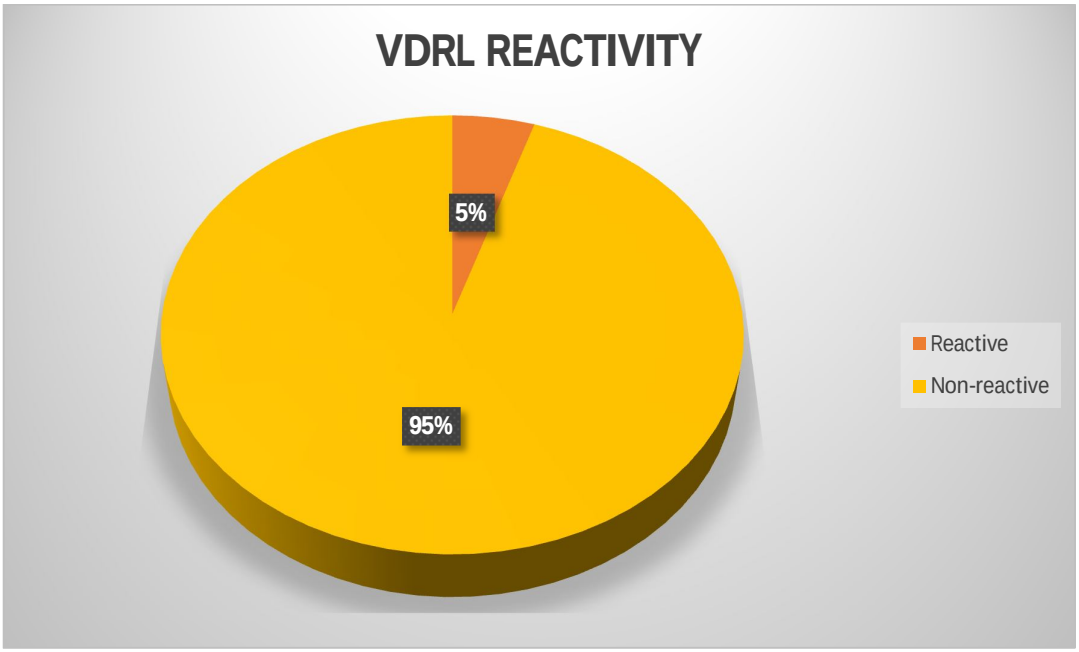
Culture from vaginal discharge	Number of positives
Trichomonas	12
Candida non albicans	10
Candida albicans	1
Negative	77



In this study, 33 patients had positive culture reports. 12 of them had positive cuture for trichomonas vaginalis. 11 of them had positive candida culture, out of them 10 were non candida albicans and one candida albicans species.

Table 17: VDRL reactivity among FSWs (n=100)

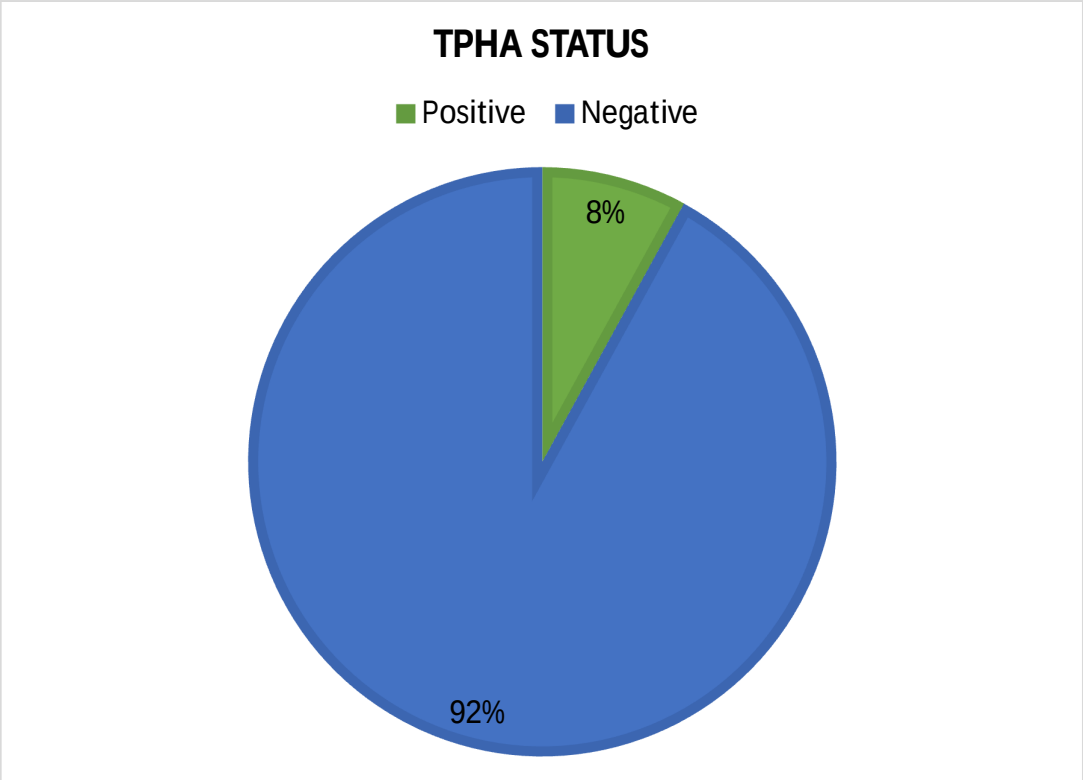
VDRL	Number
Reactive	5
Non-reactive	95



In this study 5% of the FSWs had VDRL reactivity in low titres (<1:8)

Table 18: TPHA results among FSWs

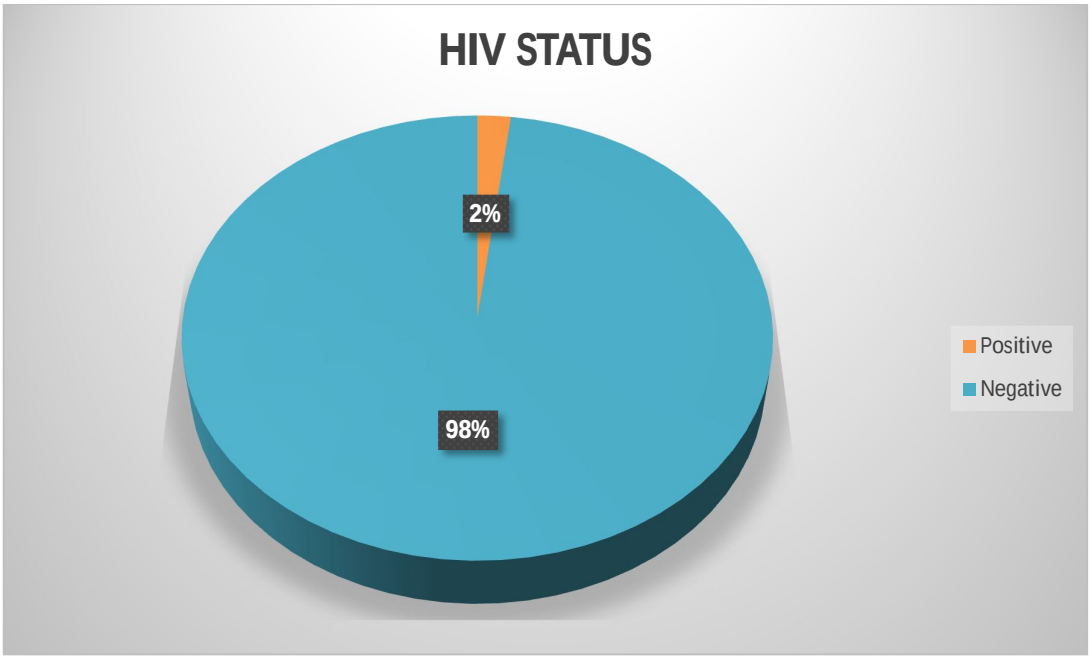
TPHA	Number
Positive	8
Negative	92



In this studyTPHA was reactive in 8(8%) FSWs and Non-reactive in 92 (92%) of them.

Table 19: Prevalence of HIV infection (n=100)

HIV Results (ELISA)	Number
Positive	2
Negative	98



In this study,HIV ELISA was positive in 2(2%) patients and negative in 98 (98%) FSWs.

.

Table 20: Infections diagnosed by clinical examination and investigations in the study group.

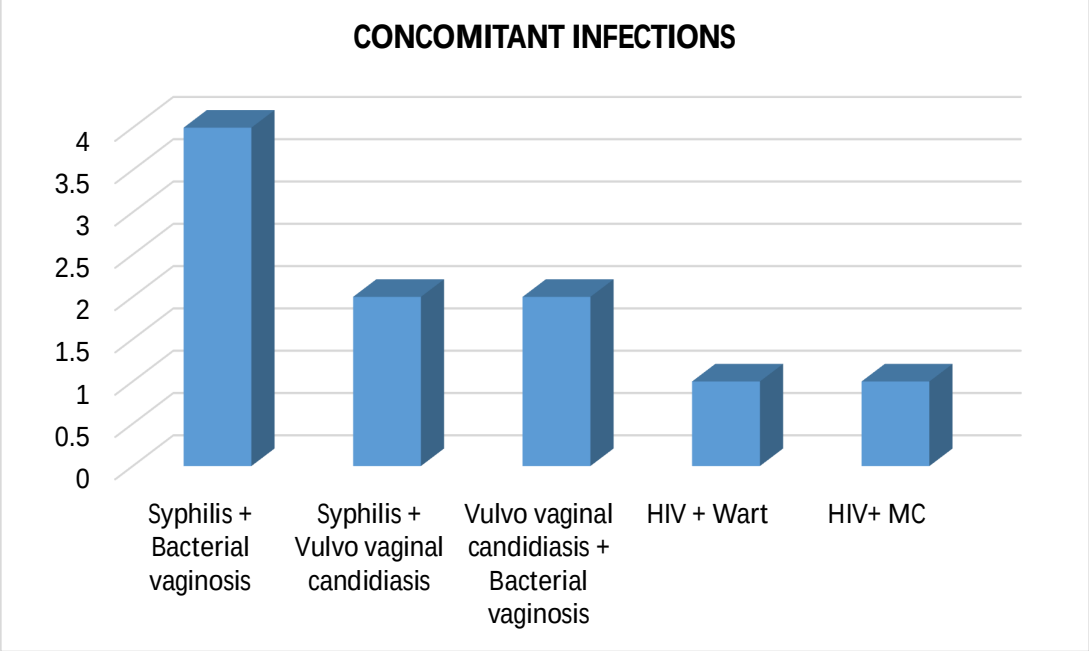
Infections	Number
Trichomonas vaginalis	12
Bacterial vaginosis	37
Vulvo Vaginal candidiasis	11
Genital herpes	-
HIV	2
Ano Genital wart	1
Molluscum contagiosum	1
Secondary syphilis	-
Early latent syphilis	-
Late latent syphilis	8
Gonorrhoeae	-
Non gonococcal urethritis	
Scabies	1
Hepatitis B	0
Hepatitis C	0

In this study, bacterial vaginosis was the most common infection 37%, followed by trichomonas vaginitis 12%. 11% FSWs had Vulvovaginal candidiasis and 8% diagnosed to have Late latent syphilis. HIV was found in 2% of them.

Table 21: Concomitant infections in the study group of CSWs

CONCOMITANT INFECTIONS	NUMBER
Syphilis + Bacterial vaginosis	4
Syphilis + Vulvo vaginal candidiasis	2
Vulvo vaginal candidiasis + Bacterial vaginosis	2
HIV + Wart	1
HIV+ MC	1

In this study, 10 FSWs had multiple STIs. The most common concomitant infections being syphilis and bacterial vaginosis(4%).



Bacterial vaginosis, Vulvo vaginal candidiasis were the common concomitant infections found in the study.

All the HIV infected FSWs were affected with other sexually transmitted infections

IMAGES

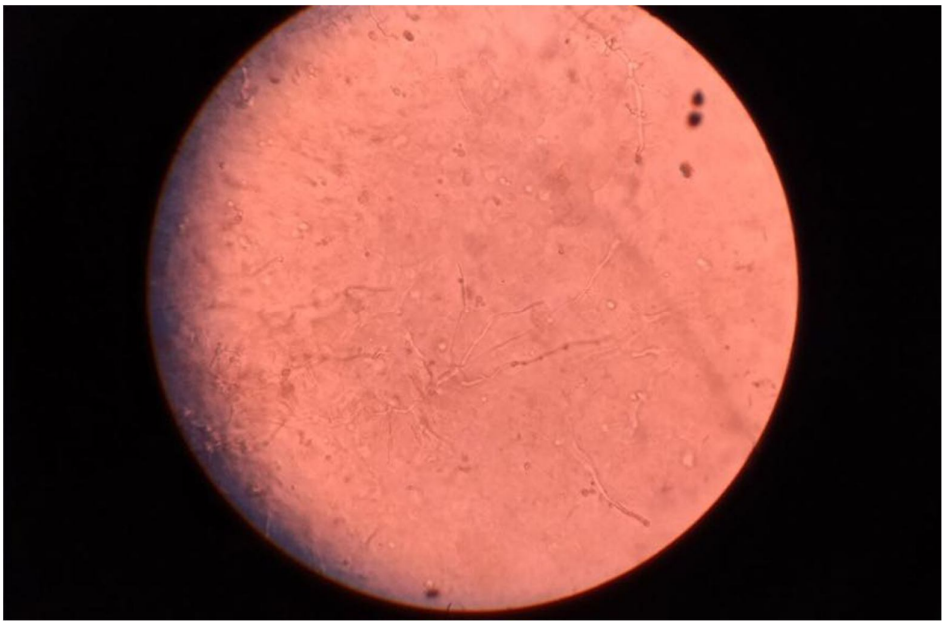


Image 1 : KOH Mount - Pseudo Hyphae & Spores

Image 2 : Vaginal Discharge seen at vaginal introitus

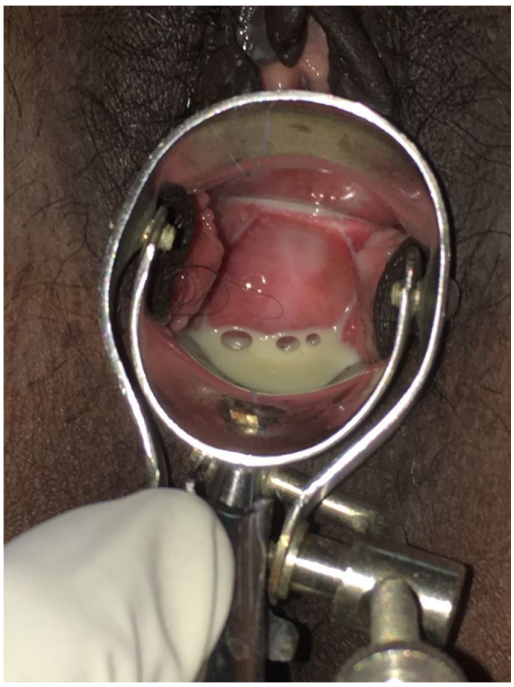


Image 3 : Frothy vaginal discharge seen on per speculum examination

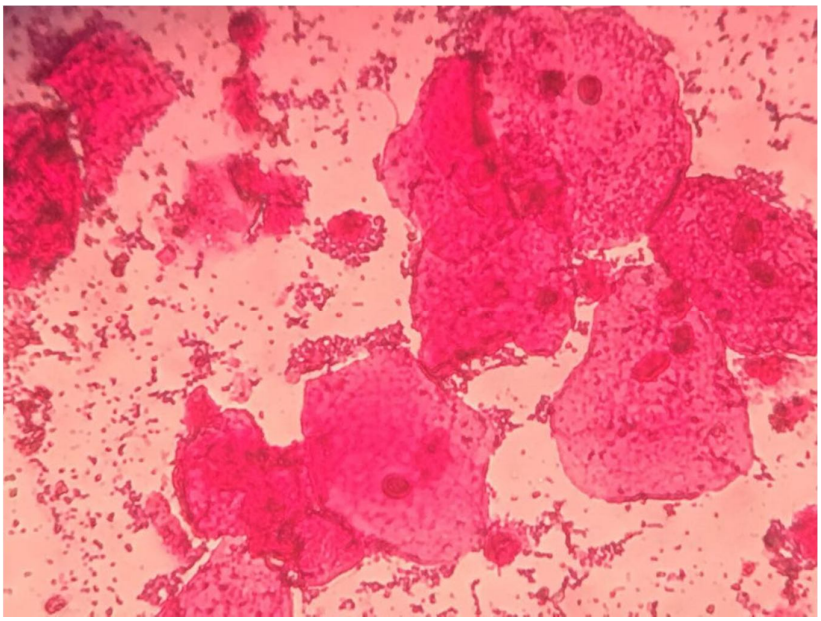


Image 4 : Gram stain of the vaginal smear showing Clue cells

Image 6 : Genital wart seen at the posterior commissure of the vulva

Discussion

DISCUSSION

During the study period, 100 FSWs were studied in detail. By clinical and laboratory investigations, 37 of them were found to have Bacterial vaginosis,12 have trichomonas vaginalis vaginitis,11 had vulvovaginal candidiasis,2 of them had HIV and 8 with late latent syphilis

The analysis of age in FSWs shows majority of FSWs were between 21-30 age (75%). This result was very high compared to Manipur study having 50.86%[17] in the 21 – 30 age group. Adolescent sex activity has increased which leads to more prone for STDs including HIV.

Majority of the FSWs belonged to lower socio-economic status (61%) i.e. less than Rs.5000 per month. This shows poverty was the main cause for sex trade.

79% FSWs were married and among them 52 % were living with their husbands which lead to increase in spread of STIs in their partners. 48% of the FSWs were able to read and write. This remains a positive factor in educating the patient about the risk of sexual behaviour, STI/HIV AIDS.

Genital discharge (41%) was the main complaint in this study. This was comparable with Kolkata study[58] (42.5%). growth in genitalia, loss of weight, lower abdominal pain were the other common symptoms noted in the study.

In this study, consistent condom usage is present in 61% of clients of female sex workers.21% of clients of FSWs had never used condoms and 18% of clients of FSWs had used condoms irregularly.

In this study most of the sexually transmitted infections are common among the FSWs who never used condoms. Bacterial vaginosis being the most common STI affecting 20 out of 21 patients in this group(95%) followed by trichomoniasis. Vulvovaginal candidiasis was the commonest genital infection in those FSWs always using condom and this group have no syphilis/HIV patients

The commonest mode of sex was normal peno vaginal 100%; peno oral was practiced by 5% and 2% practiced peno anal route. These results were comparable with Kolkata study[58] . In this study penovaginal being the most common(100%) mode of sex, most of the STIs are common in this group. Both the HIV positive cases are in this group.11 of the 12 patients with trichomonas vaginalis vaginitis are in this group.

Both of the FSWs who practiced anal sex in addition to penovaginal intercourse had TPHA positivity (100%)

In this study 72%FSWs were aware about STDs and HIV and knew that STDs /HIV could be prevented by condom use. This a positive factor in the prevention of STIs. . 37% of FSWs had past history of STIs. 81% had genital discharge, 16% had genital ulcer and 3% had genital wart.

Mucoid discharge (71%) was the most common nature of vaginal discharge. Patients with Trichomonas vaginalis vaginitis and the bacterial vaginosis had predominantly mucopurulent discharge. Typical frothy discharge was seen in $1/6^{th}$ of Trichomoniasis. More than 80% of Candidal patient had curdy white discharge. 37% patients had clue cells.

Two had reactive VDRL in low titres and 8% had positive TPHA test. This was slightly higher than the analysis done in 4.7% Thane, Maharashtra (4.7%) [92].All the FSWs showed negative results with serological tests for Hepatitis B and Hepatitis C. 2 patients had positive HIV ELISA test. This result was very less when compared to the national and international studies (43.2%,10%)[84,85].

Distribution of infection among FSWs in this study, Bacterial vaginosis was the most common infection 37%, followed by trichomonas vaginalis vaginitis 12%. 11% FSWs had Vulvovaginal candidiasis and 8% diagnosed to have Late latent syphilis. 2% have HIV. Molluscum contagiosum and genital wart were found in 1% of FSWs.

NAME OF THE STUDY	HIV	SYPHILIS SEROPOSITIVITY	TV
Van den hoek 1998-99	1.4	5.4	12.5
Our study	2	8	12

In the highly emerging HIV pandemic, the most common mode of transmission in developing countries like India remains heterosexual only. Among the transmission of STDs in the community FSWs have the major role. Hence measures taking by reducing this group and providing awareness of STDs and HIV among FSWs and making them to adapt preventive aspects will markedly reduce the overall prevalence of STI/HIV among the community.

Conclusion

CONCLUSION

1. Vaginal discharge was the most common(41%) clinical presentation among FSW.
2. Bacterial vaginosis (37%) was the commonest STI among the FSWs followed by trichomonas vaginalis vaginitis (12%) and Vulvo vaginal candidiasis (11%). 2% of the FSWs were HIV positive.
3. The FSWs belong to the lower socio economic status was 61%. 75% of FSWs belong to 21 – 30 years age group. 52% of them were uneducated.
4. FSWs using condom consistently with their clients was 18%. 61% of FSWs used condoms irregularly with their clients. 21% of FSWs were never used condoms with their clients.
5. All the HIV infected FSWs were affected with other sexually transmitted infections.
6. Peno vaginal was the commonest mode of sex(100%) followed by peno oral (5%) and peno anal (3%).

Sexually transmitted disease management in FSWs requires expert clinician to be well versed with risk assessment, clinical presentation, and diagnosis of infections and has to be familiar with new therapeutic agents. Successful reduction of STI in FSWs can be achieved because many infections are easily diagnosed and curable which paves way to reduce the HIV transmission in the community.

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Annexures

PROFORMA

"PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY"

Name: Age: Sex:

Occupation:

Education : Uneducated/ up to 5th / 12th / college

Socio Economic Status : <1000/1000-1999/2000-4999/>5000

Address :

Marital Status : Single / Married / Separated / Divorced

Presenting Complaints :

General Checkup / Screening:

Genital Ulcer :
- Duration :
- N/o :
- Recurrence :
- Painful :

Genital Discharge:
- Duration :
- Colour :
- Foul smelling :
- Consistency :
- Amount :

Itching Genitalia :

Swelling in Inguinal Region :

Skin Rash : Oral Lesion :

Burning Micturition : Jaundice :

Lower Abdominal Pain : Dyspareunia :

Treatment History

Treatment taken for present complaints

Exposure History
- Last marital contact
- Pre marital contact
- Extra marital contact

No of visit by clients/weeks

Usage of condom – always/ some times/ never

Any other contracepitive methods

Amount received from clients

Mode of sex : Oral / Vaginal / Anal

Health Seeking Behaviour

Number of months/years as FSWS

AWARNESs of STDs and treatment:-

Past History:-

Tuberculosis, Bronchial Asthma, Hypertension, Diabetes
STDs-

Contact History:

Partner Name & Card no:-

Occupation:

History and Investigation Details

Menstrual History:-

Cycles - Regular / Irregular
Last Menstrual Period

Obstetric History:

No of children

No of abortion –

if yes - 1) Induced / Spontaneous

2) Duration of gestation

Children :

Age/Sex
Mode of delivery FTND / LSCS / Forceps

Puperal Sterilisation : Done / Not

Alcohol / Smoking / I.V. drug abuse

Examination:

General Examination :-

Pallor/Icterus/Cyanosis/Clubbing/Lymphadenopathy/Pedal Edema

Pulserate :

Blood Pressure :

Systemic Examination:

Cardio Vascular System :

Respiratory System :

Per Abdomen :

Central Nervous System :

Genital Examination:-

Inguinal Nodes

External urethral meatus

Per Vaginal Examination:

Speculum examination:-

Other Systems:-

Skin & Mucous Membrane

Bones & Joints

Investigation

1) Complete Blood Count
2) Urine – Albumin, Sugar Deposit
3) Urine – Culture & Sensitivity
4) pH of the Discharge
5) Wet Mount (N.S) for Trichomonas & KOH for candida
6) Whif Test for Bacterial Vaginosis
7) Smear – Urethral / Cervical / Vaginal
   Gramstain (Clue Cells / Candida / Lactobacillus/ Organisms)
8) Endocervical culture for gonococcus
9) Candida Culture
10) Trichomonas Culture
11) Ulcer - DF for Treponoma Pallidum
    Gramstain for Haemophilus Ducreyi
    Leishman's stain for Multinucleated Giant Cells
    Tissue Smear for Calymmatobacterium
12) Blood VDRL Blood TPHA
13) USG Abdomen
14) VCTC
15) Blood for HbsAg 16) Anti HCV

INFORMATION SHEET

- We are conducting a study on prevalence of sexually transmitted diseases among female sex workers attending Rajiv Gandhi Government General Hospital, Chennai and your co-operation may be valuable to us.
- The purpose of this study is to estimate the prevalence of STI among female sex workers.
- The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.
- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.
- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.
- All female sex workers attending op will be selected for this study.

Detailed clinical history (including H/O presenting complaints, menstrual history, marital history, sexual history/ H/o last sexual contact, obstetric history, basic demographic details, past H/o sexually transmitted infections) followed by thorough clinical evaluation.

5 ml blood is withdrawn aseptically from the patient. The serum is separated and subjected to Rapid Assay test for the detection of HIV ,VDRL test,HbsAg and anti HCV antibodies.

Signature of investigator

Signature of participant

Date:

PATIENT CONSENT FORM

Title of the study : **"Prevalence of Sexually Transmitted Infections among female sex workers attending Institute of Venereology"**

Name of the participant :

Name of the principal investigator : Dr. A.S.Niraaimathi

Name of the Institution : Institute of Venereology, Madras Medical College & Rajiv Gandhi Government General Hospital, Chennai – 3.

Documentation of the informed consent:

I ---------- have read the information in this form (or it has been read to me). I was free to ask any questions and they have been answered. I am over 18 years of age and exercising my free power of choice, hereby consent to be included as a participant in the study.

1. I have read and understood this consent form and the information provided to me

2. I have had the consent document explained to me

3. I have been explained about the nature of the study

4. My rights and responsibilities have been explained to me by the investigator

5. I agree to co operate with the investigator and I will inform him/her immediately if I suffer unusual symptoms

6. I have not participated in any research study at any time

7. I am unaware of the fact that I can opt out of the study at any time without having to give any reason and this will not affect my future treatment in this hospital

8. I hereby give permission to the investigator to release the information obtained from me as a result of participation in this study to the sponsors, regulatory authorities, Government agencies and institutional ethics committee. I understand that they are publicly presented.

9. My identity will be kept confidential if my data are publicly presented

10. I am aware that if I have any question during the study, I should contact at one of the addresses listed above. By signing this consent form I attest that the information given in this document has been clearly explained to me and apparently understood by me, I will be given a copy of this consent document.

Participant initials:

For adult participants:

Name and signature/ thumb impression of the participant (or legal representative if participant incompetent)

_____	_____	----------
Name	Signature	Date

Name and signature of impartial witness (required for illiterate patients):

_____	_____	_____
Name	Signature	Date

Address and contact number of the impartial witnesss :

Name and signature of the investigator or his representative obtaining consent:

_____	_____	_____
Name	Signature	Date

ஆய்வு தகவல் தாள்

ஆராய்ச்சியின் தலைப்பு : **பெண் பாலியல் தொழிலாளர்களிடம் பால்வினை நோய்கள் பரவுதல் பற்றிய ஒரு ஆய்வு.**

ஆய்வாளர் : **மரு. அ.சா. நிறைமதி**

பங்கேற்பாளர் : **வயது :**

ஆராய்ச்சி மையம் : **பால்வினை நோய் துறை,**
இராஜீவ் காந்தி அரசு பொது மருத்துவமனை, சென்னை.

இந்த ஆய்வில் பங்கேற்பதற்காக தாங்கள் அழைக்கப்படுகிறீர்கள். இந்த ஆவணத்தில் உள்ள தகவல்கள் தாங்கள் இந்த ஆய்வில் பங்கேற்க முடிவு செய்துக் கொள்ள உதவும். இதில் ஏதேனும் சந்தேகம் இருந்தால் வெளிப்படையாக கேள்விகளைக் கேட்டு தெரிந்துக் கொள்ளலாம்.

நாங்கள் இராஜீவ் காந்தி அரசு பொது மருத்துவமனை பால்வினை நோய்துறையில் பெண் பாலியல் தொழிலாளர்களிடம் பாலியம் நோய்களின் பரவுதல் பற்றிய ஆய்வை நடத்துகிறோம்.

அதற்கு உங்கள் பங்களிப்பு எங்களுக்கு பெரிதும் உதவக்கூடும்.

இந்த ஆய்வின் நோக்கம்:

இவ்வாராய்ச்சியில் தங்களிடையே அடிப்படை மற்றும் பாலியல் நோய் குறித்த விரிவான கேள்விகள் கேட்கப்படும். பின்னர் நீங்கள் மருத்துவ ரீதியான பிறப்புறுப்பின் பரிசோதனைக்கு உட்படுத்தப்படுவீர்கள்.

அனைவரிடமும் பிறப்புறுப்பில் இருந்து நீர் எடுத்து Wet Mount, Gram Stain, Candida Culture, Trichomonas Culture, Gonococcal Culture, தேவைப்பட்டால் Dark Field போன்ற பரிசோதனைகளுக்கு உட்படுத்தப்படுவீர்கள். அனைவரிடமும் இரத்த மாதிரி பெறப்பட்டு (VCTC, VDRL, TPHA, HBsAg, Anti HCV) பரிசோதனைகளும் செய்யப்படும்.

தங்களது மருத்துவ சிகிச்சை குறித்த தகவல்கள் இரகசியமாக பாதுகாக்கப்படும். ஆய்வின் போதோ அல்லது முடிவுகளை வெளியிடும் போதோ தங்களது பெயரையோ, அடையாளங்களையோ வெளியிடமாட்டோம் என்பதை தெரிவித்துக் கொள்கிறோம்.

இந்த ஆய்வில் பங்கேற்பது உங்களுடைய விருப்பத்தின் பேரில் தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆய்விலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக் கொள்கிறோம். இந்த ஆய்வில் பங்கேற்காவிட்டாலும் நீங்கள் வழக்கமான சிகிச்சையை தொடர்ந்து பெறலாம்.

இந்த ஆய்வின் முடிவு தங்களுக்கு ஆய்வின் இறுதியிலோ அல்லது ஆய்வின் போதிலோ தெரியப்படுத்தப்படும்.

ஆய்வாளர் கையொப்பம்

பங்கேற்பாளர் / பாதுகாவலர்
கையொப்பம்

தேதி :

சுய ஒப்புதல் படிவம்

ஆராய்ச்சியின் தலைப்பு : பெண் பாலியல் தொழிலாளர்களிடம் பால்வினை நோய்கள் பரவுதல் பற்றிய ஒரு ஆய்வு.

பெயர் : வயது : தேதி : உள்நோயாளி எண் :

..... என்பவராகிய நான் இந்த ஆய்வின் விவரங்களும் அதன் நோக்கங்களும் முழுமையாக அறிந்து கொண்டேன். எனது சந்தேகங்கள் அனைத்திற்கும் தகுந்த விளக்கம் அளிக்கப்பட்டது. இந்த ஆய்வில் முழு சுதந்திரத்துடன் மற்றும் சுயநினைவுடன் பங்கு கொள்ள சம்மதிக்கிறேன்.

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்து கொண்டு நான் எனது சம்மதத்தைத் தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தை பற்றி எனக்கு விளக்கப்பட்டது.

இந்த ஆய்வினை பற்றிய அனைத்து தகவல்களும் எனக்கு தெரிவிக்கப்பட்டது. இந்த ஆய்வில் எனது உரிமை மற்றும் பங்கினை பற்றி அறிந்து கொண்டேன்.

இந்த ஆய்வில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில்தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆராய்ச்சியிலிருந்து எந்நேரமும் பின் வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்து கொண்டேன்.

இந்த ஆய்வில் கலந்து கொள்வதன் மூலம் என்னிடம் பெறப்படும் தகவலை ஆய்வாளர் இன்ஸ்டிட்யூசனல் எத்திக்ஸ் கமிட்டியினரிடமோ, அரசு நிறுவனத்திடமோ தேவைப்பட்டால் பகிர்ந்து கொள்ளலாம் என சம்மதிக்கிறேன்.

இந்த ஆய்வின் முடிவுகளை வெளியிடும்போது எனது பெயரோ, அடையாளமோ வெளியிடப்பட்டாது என அறிந்து கொண்டேன். இந்த ஆய்வின் விவரங்களைக் கொண்ட தகவல் தாளைப் பெற்று கொண்டேன். இந்த ஆய்விற்காக பிறப்புறுப்பில் இருந்து நீர் எடுத்து Wet Mount, Gram Stain, Candida Culture, Trichomonas Culture, Gonococcal Culture, தேவைப்பட்டால் Dark Field போன்ற பரிசோதனைகளுக்கு உட்படுத்தப்பட்டு மற்றும் இரத்த மாதிரி பெறப்பட்டு (VCTC, VDRL, TPHA, HBsAg, Anti HCV) பரிசோதனைகளும் செய்து கொள்ள சம்மதிக்கிறேன்.

இந்த ஆய்வில் பங்கேற்கும் பொழுது ஏதேனும் சந்தேகம் ஏற்பட்டால், உடனே ஆய்வாளரை தொடர்பு கொள்ள வேண்டும் என அறிந்து கொண்டேன்.

இச்சுய ஒப்புதல் படிவத்தில் கையெழுத்திடுவதன் மூலம் இதிலுள்ள அனைத்து விஷயங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது என்றும் தெரிவிக்கிறேன் என்று புரிந்து கொண்டேன். இச்சுய ஒப்புதல் படிவத்தின் ஒரு நகல் எனக்கு கொடுக்கப்படும் என்றும் தெரிந்து கொண்டேன்.

பங்கேற்பாளர் / பாதுகாவலர் கையொப்பம் தேதி :

ஆய்வாளர் கையொப்பம்

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301A
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.A.S. Niraaimathi
Post Graduate in MD DVL
Madras Medical College
Chennai 600 003

Dear Dr.A.S.Niraaimathi,

The Institutional Ethics Committee has considered your request and approved your study titled **"PREVALENCE OF SEXUALLY TRANSMITTED INFECTIONS AMONG FEMALE SEX WORKERS ATTENDING INSTITUTE OF VENEREOLOGY" NO. 20112016.**

The following members of Ethics Committee were present in the meeting hold on **01.11.2016** conducted at Madras Medical College, Chennai 3

1.Dr.C.Rajendran, MD.,	:Chairperson
2.Dr.M.K.Muralidharan,MS.,M.Ch.,Dean, MMC,Ch-3	:Deputy Chairperson
3.Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3	: Member Secretary
4.Prof.B.Vasanthi,MD., Prof.of Pharmacology.,MMC,Ch-3	: Member
5.Prof.A.Rajendran,MS, Prof. of Surgery,MMC,Ch-3	: Member
6.Prof.N.Gopalakrishnan,MD,Director,Inst.of Nephrology,MMC,Ch	: Member
7.Prof.Baby Vasumathi,MD.,Director, Inst. of O & G	: Member
8.Prof.K.Ramadevi,MD.,Director,Inst.of Bio-Che,MMC,Ch-3	: Member
9.Prof.R.Padmavathy, MD, Director,Inst.of Pathology,MMC,Ch-3	: Member
10.Prof.S.Mayilvahanan,MD,Director, Inst. of Int.Med,MMC, Ch-3	: Member
11.Tmt.J.Rajalakshmi, JAO,MMC, Ch-3	: Lay Person
12.Thiru S.Govindasamy, BA.,BL,High Court,Chennai	: Lawyer
13.Tmt.Arnold Saulina, MA.,MSW.,	:Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary – Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

URKUND

Urkund Analysis Result

Analysed Document: rol.docx (D30749575)
Submitted: 9/24/2017 6:48:00 AM
Submitted By: drniru91@gmail.com
Significance: 1 %

Sources included in the report:

SKIN THESIS PRINT (Autosaved) (1).docx (D21581539)

Instances where selected sources appear:

1

MASTER CHART

S. No.	age	marital status	education	address	personal	last contact	protected or not	discharge / examination	cervix	microscopy	culture	VDRL	TPHA	VCTC	mode of sex	condom usage	past history	HIV awareness
1	21	single	10 th	kolkata	nil significant	1 month	protected	moderate mucopurulent	healthy	clue cells	negative	non reactive	negative	positive	penovaginal	never	no	yes
2	24	married	illeterate	kolkata	nil significant	1 week	protected	moderate mucopurulent	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	no
3	29	married	8 th	kolkata	nil significant	2 weeks	protected	moderate mucoid	healthy	clue cells	negative	reactive	positive	negative	penovaginal	never	yes	yes
4	31	married	8 th	mylapore	tatooing,tobaco chewing	2 months	protected	moderate mucoid	erosion	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	always	yes	yes
5	27	seperated	9 th	mylapore	nil significant	3 weeks	unprotected	profuse mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	yes	yes
6	25	seperated	illeterate	mylapore	nil significant	3 months	protected	moderate mucopurulent	healthy	negative	negative	non reactive	negative	positive	penovaginal	sometimes	yes	no
7	25	married	12 th	mylapore	nil significant	3 weeks	protected	curdy white	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
8	20	single	illeterate	mylapore	nil significant	1 week	protected	moderate mucopurulent	healthy	pseudohyphae+spores	candida albicans	non reactive	positive	negative	anal & penovaginal	always	yes	yes
9	21	married	illeterate	mylapore	nil significant	1 month	protected	moderate mucopurulent	healthy	clue cells	negative	reactive	positive	negative	penovaginal	sometimes	yes	yes
10	36	single	8 th	mylapore	nil significant	4 months	protected	moderate mucopurulent	erosion	clue cells	negative	non reactive	negative	negative	penovaginal	always	no	no
11	24	seperated	illeterate	mylapore	nil significant	3 days	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
12	20	married	8th	mylapore	nil significant	4 months	protected	moderate mucopurulent	healthy	clue cells	candida non albicans	non reactive	negative	negative	penovaginal	sometimes	yes	yes
13	26	married	10th	mylapore	nil significant	3 weeks	protected	moderate mucopurulent	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	no
14	21	single	illeterate	mylapore	tatooing	10 days	protected	moderate mucoid	erosion	clue cells	negative	non reactive	negative	negative	penovaginal	always	yes	yes
15	27	seperated	illeterate	mylapore	nil significant	5 days	protected	moderate mucopurulent	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	always	yes	yes
16	33	married	8th	mylapore	nil significant	3 months	unprotected	molluscum contagiosm	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
17	20	widow	illeterate	chennai	nil significant	1 week	protected	scanty mucoid	healthy	negative	negative	non reactive	negative	negative	peno oral	always	yes	yes
18	24	married	illeterate	andhra	nil significant	2 weeks	protected	mild mucoid	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	sometimes	no	no
19	21	single	illeterate	kolkata	tatooing	1 week	protected	moderate mucopurulent	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
20	23	married	illeterate	mylapore	nil significant	20 days	unprotected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	no
21	21	widow	illeterate	mylapore	tatooing	1 month	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes
22	22	single	8th	kolkata	tatooing	7 days	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
23	22	single	10th	new delhi	nil significant	2 weeks	unprotected	profuse mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	yes	yes
24	26	married	illeterate	new delhi	tatooing	1 month	unprotected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes
25	22	married	5th	mylapore	nil significant	4 months	unprotected	mild mucoid	healthy	clue cells	negative	reactive	positive	negative	penovaginal	sometimes	yes	no
26	24	seperated	7th	mylapore	nil significant	3 months	unprotected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
27	29	married	6th	andhra	nil significant	20 days	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
28	42	widow	8th	mylapore	nil significant	2 weeks	protected	curdy white	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
29	26	seperated	9th	mylapore	nil significant	2 months	protected	curdy white	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes
30	21	married	8th	mylapore	nil significant	10 days	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes
31	21	married	10th	mylapore	nil significant	1 month	unprotected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
32	25	married	12th	mylapore	nil significant	4 months	unprotected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes

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33	14	single	illeterate	salligramam	nil significant	1 month	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	no
34	36	married	9th	mylapore	nil significant	3 months	unprotected	moderate mucopurulent	erosion	> 30 pus cells	negative	non reactive	positive	negative	anal & penovaginal	sometimes	yes	no
35	30	widow	illeterate	erode	nil significant	1 week	protected	moderate mucopurulent	healthy	clue cells/pseudohyphae+spores	candida non albicans	reactive	positive	negative	penovaginal	always	yes	yes
36	28	seperated	12th	kk nagar	nil significant	1 week	unprotected	mild mucoid	healthy	<30 pus cells	negative	non reactive	negative	negative	penovaginal	never	yes	no
37	20	married	ug	nellore	nil significant	1 week	protected	profuse mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
38	20	married	12th	bangalore	nil significant	2 months	protected	curdy white	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
39	25	single	illeterate	bangalore	nil significant	1 week	unprotected	moderate mucopurulent	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	yes
40	22	single	12th	mylapore	nil significant	1 month	protected	frothy	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	sometimes	no	yes
41	25	married	10th	mylapore	nil significant	1 month	unprotected	moderate mucopurulent	erosion	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
42	22	married	illeterate	mylapore	nil significant	5 days	unprotected	moderate mucopurulent	healthy	clue cells	negative	reactive	positive	negative	penovaginal	sometimes	yes	no
43	23	married	illeterate	mylapore	nil significant	2 weeks	unprotected	profuse mucoid	healthy	clue cells	negative	non reactive	positive	negative	penovaginal	sometimes	yes	yes
44	20	single	10th	mylapore	nil significant	1 week	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	no
45	32	seperated	illeterate	mylapore	tatooing	4 days	protected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
46	24	single	9 th	mylapore	nil significant	2 months	unprotected	mild mucoid	healthy	clue cells/pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	always	yes	yes
47	25	married	illeterate	mylapore	tatooing	1 week	unprotected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	no
48	30	married	7th	mylapore	nil significant	1 week	protected	mild mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	sometimes	no	no
49	25	single	illeterate	mylapore	nil significant	20 days	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	never	no	no
50	23	married	7th	mylapore	smoking	15 days	protected	mild mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	sometimes	no	yes
51	25	married	BSC	mylapore	alcoholic	2 months	protected	profuse mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
52	23	single	10th	mylapore	tobacco	2 months	unprotected	moderate mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	no	no
53	26	married	illeterate	mylapore	nil significant	2 months	protected	profuse mucoid	erosion	>30 pus cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
54	35	seperated	illeterate	mylapore	nil significant	1 month	unprotected	curdy white	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	always	no	yes
55	22	single	10th	mylapore	nil significant	2 months	protected	scanty mucoid	healthy	< 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
56	26	married	6th	mylapore	nil significant	15 days	protected	scanty mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
57	23	seperated	10th	mylapore	nil significant	1 month	unprotected	scanty mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
58	21	widow	illeterate	andhra	nil significant	20 days	protected	profuse mucoid	erosion	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	no	yes
59	40	widow	illeterate	kolkata	tatooing	20 days	unprotected	moderate mucopurulent	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
60	27	married	10th	mylapore	nil significant	2 weeks	unprotected	scanty curdy white	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	never	no	no
61	28	single	illeterate	mylapore	nil significant	2 years	unprotected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	no
62	25	married	illeterate	mylapore	nil significant	2 months	unprotected	moderate mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	sometimes	no	yes
63	25	married	illeterate	mylapore	nil significant	1 month	unprotected	mild mucoid	erosion	clue cells	negative	non reactive	negative	negative	peno oral & penovaginal	never	no	yes

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64	25	seperated	illeterate	chennai	nil significant	25 days	unprotected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	yes	yes
65	20	married	illeterate	chennai	nil significant	1 year	unprotected	moderate mucoid	healthy	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
66	33	seperated	7th	mylapore	nil significant	4 months	unprotected	moderate mucoid	erosion	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
67	21	seperated	3rd	mylapore	nil significant	1 week	protected	moderate mucopurulent	erosion	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
68	20	single	4th	mylapore	nil significant	1 month	unprotected	profuse mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
69	28	single	8th	mylapore	nil significant	6 months	unprotected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	no	yes
70	27	married	5th	mylapore	nil significant	1 month	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
71	36	married	illeterate	mylapore	nil significant	20 days	protected	profuse mucoid	healthy	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	no
72	22	married	illeterate	mylapore	nil significant	25 days	protected	mild mucoid	erosion	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
73	23	single	8th	mylapore	nil significant	1 month	protected	frothy	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	no	no
74	21	widow	illeterate	ambattur	tatooing	20 days	protected	profuse mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	peno oral & penovaginal	never	no	yes
75	39	widow	illeterate	mylapore	nil significant	1 week	unprotected	curdy white	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	never	no	no
76	23	seperated	10 th	chennai	nil significant	2 months	unprotected	mild mucoid/genital wart	healthy	negative	negative	non reactive	negative	positive	penovaginal	always	no	yes
77	28	unmarried	8 th	chennai	nil significant	6 years	unprotected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
78	25	married	illeterate	chennai	nil significant	25 days	unprotected	moderate mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	no	yes
79	22	married	illeterate	chennai	nil significant	1 year	unprotected	moderate mucoid	healthy	< 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	no
80	21	seperated	illeterate	chennai	tatooing	1 week	protected	profuse mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	never	yes	no
81	33	married	illeterate	chennai	nil significant	4 months	unprotected	mild mucoid	erosion	< 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
82	20	married	illeterate	chennai	nil significant	1 month	protected	profuse mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	always	no	no
83	26	married	illeterate	chennai	nil significant	1 week	protected	moderate mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	no	yes
84	32	widow	illeterate	chennai	nil significant	1 month	unprotected	curdy white	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	never	no	no
85	27	seperated	8 th	chennai	nil significant	20 days	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	no	yes
86	25	married	illeterate	chennai	nil significant	10 days	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	peno oral & penovaginal	sometimes	yes	no
87	23	married	10th	chennai	nil significant	3 weeks	unprotected	profuse mucoid	erosion	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	no	yes
88	28	married	illeterate	chennai	nil significant	1 month	unprotected	profuse mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	no	yes
89	33	seperated	bsc	kolkata	nil significant	1 week	protected	curdy white	healthy	pseudohyphae+spores	candida non albicans	non reactive	negative	negative	penovaginal	sometimes	no	yes
90	22	unmarried	illeterate	chennai	nil significant	3 months	unprotected	profuse mucoid	healthy	trichomonas	trichomonas	non reactive	negative	negative	penovaginal	never	no	no
91	29	married	illeterate	chennai	nil significant	4 months	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
92	28	married	illeterate	chennai	nil significant	1 week	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	peno oral & penovaginal	sometimes	no	no
93	26	married	6th	chennai	nil significant	2 weeks	protected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
94	30	married	illeterate	chennai	nil significant	3 weeks	unprotected	mild mucoid	erosion	> 30 pus cells	negative	non reactive	negative	negative	penovaginal	always	no	yes
95	32	seperated	illeterate	andhra	nil significant	10 days	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes

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96	24	married	illeterate	chennai	nil significant	6 months	protected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
97	25	married	illeterate	chennai	nil significant	2 months	protected	mild mucoid	healthy	clue cells	negative	non reactive	negative	negative	penovaginal	sometimes	no	yes
98	30	married	illeterate	chennai	nil significant	2 weeks	unprotected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
99	22	married	10th	chennai	nil significant	2 weeks	protected	mild mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes
100	23	married	illeterate	chennai	nil significant	4 weeks	protected	moderate mucoid	healthy	negative	negative	non reactive	negative	negative	penovaginal	always	no	yes